THE AMERICAN
JOURNAL OF PHARMACY

OCTOBER, 1898.

ANALYSIS OF THE RHIZOME OF ARALIA CALIFORNICA.

By William R. Monroe, P.C.

Contribution from the Chemical Laboratory of the Philadelphia College of Pharmacy. No. 179.

Aralia californica is an herbaceous perennial which grows from creeping rhizomes. In *Fig. 1* is an illustration of one of these rhizomes. The plant is common in shaded mountain ravines of the Coast Range, from the Gavilan Mountains, northward; it is also found in Sierra County, California. It prefers rich soil and an abundance of moisture, and grows more luxuriantly along streams. It could be obtained in commercial quantities, if desired.

The rhizomes used in this work were collected by the Experimental Bureau of the University of California.

They were in a very moist condition when received; and, as they had an aromatic odor, it was deemed best to make the determinations upon the material as received. Accordingly some of the finely chopped material was exhausted by maceration with successive portions of official alcohol. The alcoholic liquids were mixed, and the solvent removed from the dissolved substances by distillation. The percentage amounts are all based on the fresh rhizome, which contained 70·20 per cent. of moisture.

The official alcohol extracted 5·39 per cent. of the fresh rhizome. The extract was of a reddish-brown color. About two-thirds of it was soluble in hot water. The aqueous solution had a neutral reaction toward litmus. It contained sugars equivalent, in their action on Fehling's solution, to 0·23 per cent. of glucose and 0·13

per cent. of saccharose; smaller quantities of mucilage were also present. The aqueous solution contained a substance which reduced gold and silver salts, and precipitated calcium hydrate; this substance was very probably oxalic acid, the occurrence of considerable quantities of which, as calcium oxalate, is hereafter noted. Tannins were absent. The aqueous solution afforded heavy brownish pre-

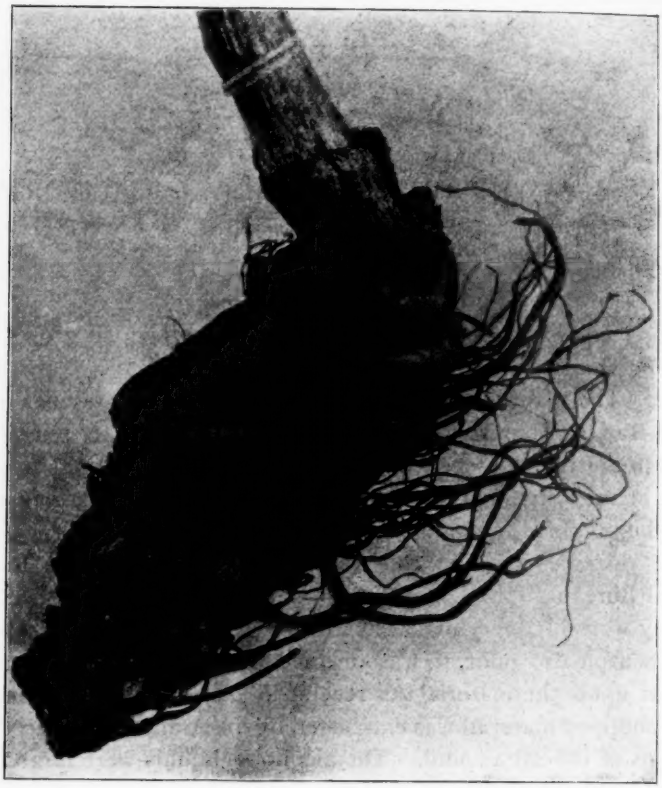

FIG. 1.—Rhizome with roots and part of overground stem of *Aralia Californica.*

cipitates with phosphotungstic acid, potassium triiodide, and mercuric potassium iodide test solution, but the substance causing these reactions, could not be removed by agitating the aqueous solution, either acidulated or made alkaline, with benzin, ether, or chloroform; hence they were not alkaloids. The substance which precipi-

tated with the alkaloidal reagents was thrown out of solution upon adding to the aqueous liquid five times its volume of alcohol.

The residue of the alcoholic extract of the fresh rhizome left undissolved by water was dissolved in hot alcohol. It consisted chiefly of resinous substances. These gave a light-brown precipitate with an alcoholic solution of ferric chloride, and a similar, but lighter colored, precipitate with alcoholic solution of lead acetate. The resinous substances were precipitated when the alcoholic solution was poured into water. The precipitated substances were soluble in part in aqueous solution of potassium hydrate; the remainder was soluble in an alcoholic solution of the same reagent.

That portion of the recent rhizome which was insoluble in official alcohol was submitted to Dragendorff's scheme of plant analysis. The process revealed the presence of a small quantity of a fat or wax saponifiable by alcoholic solution of potassium hydrate. A small amount of resin was also present. Mucilage and albuminous matter were found in the aqueous extract to the extent of 0·75 per cent., and in the alkaline aqueous extract to the amount of 0·98 per cent. Minute quantities of dextrin, glucose and saccharose were present. Pararabin and a very considerable amount of calcium oxalate were found in the acidulated water extract. The calcium oxalate separated as crystals, when the acidulated water, which was a weak hydrochloric acid, was evaporated. The crystals were needle-shaped, and arranged themselves in stellate groups.

When received the rhizome contained 70·20 per cent. of moisture and 2·22 per cent. of ash. The ash consisted of potassium carbonate, chloride and sulphate, and calcium, magnesium, aluminum and iron, in the form of carbonates and phosphates. A small amount of silica was also present.

The odor of the rhizome caused a special search to be made for volatile oil. For this purpose, 1 kilogramme of the fresh material was finely chopped, placed in a still, and, after allowing it to macerate with water over night, heated with the water. A very small amount, less than 2 c.c., of volatile oil collected in the receiving vessel. The liquid which came over with the oil was neutral to litmus. The oil had a pale-yellow color, and a very aromatic odor; the latter resembled the odor of carrots. Upon standing, the odor of the oil became more pleasant. The oil floated on water. It was soluble in alcohol.

Starch was found in the rhizome. An estimation of it made on the fresh material showed 1·67 per cent.

A special examination of a kilogramme of the rhizome for saponin was made by the method of Christophsohn and Otten, but the principle was not found.

NOTES ON ESTIMATING EUCALYPTOL.[1]

By Lyman F. Kebler.

From the great variety of oils of eucalyptus met with in commerce, it would seem that each species (about 120) of the Eucalyptus genus, yielded a distinctively characteristic oil. Just how to differentiate the officially recognized oils from the undesirable material is not an easy task; especially when it is remembered that the U.S.P. recognizes the oils distilled from the fresh leaves of *Eucalyptus globulus*, Labillardiere; *Eucalyptus oleosa*, F. v. Müller, and some other species of *Eucalyptus*.

The specific gravity is a valuable indicator when the oil is "straight," but the oils can be so mixed as to render this factor of little service. The same is true of the rotatory power. The phellandrene test is of considerable service, but what is wanted, after all, is the amount of eucalyptol in the oil.

In 1894 Mr. L. R. Scammell[2] took out a patent for the preparation of eucalyptol on a large scale. The basis of this patent is the property of eucalyptol to form a crystalline compound with phosphoric acid of a certain strength. The process consists in adding concentrated phosphoric acid (Sp. Gr. 1.75 to 1.785, preferably the latter), in slight excess, to the oil at the ordinary temperature, but not above 60° F. The eucalyptol phosphate crystallizes out, is purified by pressure or centrifugally, and is then decomposed with hot water.

Just how far this process will lend itself to quantitatively estimating eucalyptol is fairly well settled. Mr. Faulding, commenting[3] on the method, lauds it to the skies, but does not give any data for his affirmations. Mr. Helbing,[4] on the other hand, considers the

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[1] Read at the Baltimore meeting of the American Pharmaceutical Association.

[2] 1894, Eng. Pat., No. 14,138, July 23d.

[3] 1895, *Chemist and Druggist*, 46, 310.

[4] *Pharm. Record*, No. 33, p. 26.

method valueless for quantitative work. It is with the latter that the writer's experience coincides. For estimating eucalyptol the method is unsatisfactory, but as a means for detecting the presence of eucalyptol in the oil, it is of much service. This is good so far as it goes, but the all-essential, how much, is lacking.

The writer has made some experiments along another line that may be of interest. The eucalyptol phosphate is obtained by cooling the oil in ice-water, gradually adding half its volume of phosphoric acid, with agitation, cautiously keeping cool. The contents of the beaker can readily be kept cool as follows: Add the acid to the oil, cool the mixture in ice-water, then slowly agitate with a glass rod until uniformity results. After preparing the eucalyptol phosphate, it is purified between folds of filter paper by means of heavy pressure. This portion of the work having been *well* done, the solid mass ought to consist of eucalyptol, phosphoric acid and traces of water and oil constituents, aside from eucalyptol. By weighing this addition product we have the combined amount of eucalyptol and phosphoric acid. Now, by treating the eucalyptol phosphate with hot water, decomposition results and the phosphoric acid can readily be estimated by titrating with a volumetric solution of potassium hydroxide. The eucalyptol is easily obtained by difference.

The method as executed by the writer, is as follows: 8 grammes of the oil are weighed out in a suitable beaker, cooled in ice-water, 4 c.c. of phosphoric acid (1·75) added and again placed in ice-water. After cooling, the contents of the beaker are slowly and thoroughly mixed by means of a glass rod, the eucalyptol phosphate removed, purified by pressure, weighed, decomposed with hot water, and the acid estimated by means of a standard alkaline solution. Of course it is understood that smaller quantities can be worked with. It is necessary to add more of the phosphoric acid in some cases. This is true in the case of pure eucalyptol. Twice the above amount was added for the results obtained in this paper.

The result obtained by the above process for pure eucalyptol and a number of oils are given in the table below. Other data are also included.

Number.	Specific Gravity at 15° C.	Grammes of solid Eucalyptol Phosphate.	Per cent. of Eucalyptol, by Difference.	Per cent. of Eucalyptol, Direct.
1	0·9350	14·78	103·75	62·14
2	0·9153	10·70	73·62	31·20
3	0·9116	8·10	54·75	23·17
4	0·8912	7·13	43·62	24·29
5	0·8955	3·50	23·37	—
6	0·8876	Did not congeal	—	—
7	0·9081	Did not congeal	—	—
8	0·9424	9·9	73·84	49·23

No. *one* was pure eucalyptol. Nos. *two* and *eight* were marked fancy oils, and commanded a high price. The remaining oils are such as are commonly met with in the wholesale trade.

The solid eucalyptol phosphate was obtained from 8 grammes of substance. The per cent. of eucalyptol by difference was obtained by the above process. The per cent. of eucalyptol, direct, was obtained by Mr. Scammell's process.

The above method does not give absolute results, as can readily be seen from the amount of eucalyptol, in pure eucalyptol, but the results are close approximations. The method will undoubtedly be of service, being short and easily executed.

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ANALYSIS OF LEMON SYRUPS.[1]

By A. Borntræger.

For the detection of sulphuric, hydrochloric and boric acids a solution of the sample was evaporated with soda, and the residue charred. One portion of the aqueous extract of the residue was then acidified with hydrochloric acid, and a second portion with nitric acid, and the two portions tested respectively with barium

[1] *Zeitschr. f. Untersuch. der Nahr. u. Genussmittel*, 1898, p. 225; abstract in *The Analyst*, 1898, p. 176.

chloride and silver nitrate. A third portion was acidified with hydrochloric acid and tested for boric acid with turmeric paper.

Oxalic acid was tested for by heating an aqueous solution with neutral calcium acetate. For the detection of salicylic acid an aqueous solution was shaken with chloroform, the chloroform removed and filtered repeatedly through dry filter-paper until clear, evaporated, the residue taken up with water, and a dilute solution of ferric chloride added.

The heavy metals were tested for by sulphuretted hydrogen and ammonium sulphide. The total acidity was determined by titration, and from the result that due to tartaric acid was deducted, the remainder being reckoned as citric acid.

The tartaric acid was determined by precipitating as acid potassium tartrate and titrating. To a solution of 20 grammes of the syrup was added 5 grammes of potassium chloride, the solution neutralized with solution of potash and made up to 50 c.c. A solution of 5 grammes of citric acid was then added, the solution stirred, allowed to stand over night, the precipitated acid potassium tartrate washed, first with a saturated solution of cream of tartar, and afterwards twice with a 10 per cent. solution of potassium chloride, and finally titrated hot.

For the detection of soluble starch, gum and dextrin, a moderately strong solution was mixed with six times its bulk of absolute alcohol, the alcohol removed, the residue dissolved in water, and alcohol again added, and the same procedure repeated until the residue contained nothing further of a reducing nature. The residue was then dissolved in water, boiled for fifteen minutes with hydrochloric acid, neutralized and tested with Fehling's solution.

For the detection of gelatin an aqueous solution was tested direct with a solution of tannin. As, however, the presence of much citric acid hinders the precipitation, it is advisable to first neutralize with soda. The presence of an excess of soda, on the other hand, redissolves the precipitate.

For the determination and identification of the sugar, a solution was made by dissolving 5 grammes in 100 c.c. of water. For the determination of the reducing-sugar 25 c.c. of the solution were neutralized with soda and diluted to 100 c.c. Ten c.c. of Fehling's solution and 40 c.c. of water were then added and the titration carried out according to Soxhlet's directions. As the solution of the

syrup polarized to the right, and contained no saccharose, the results were reckoned as dextrose. The method used for the detection of saccharose depends upon its inversion by hydrochloric acid. Twenty-five c.c. of the 5 per cent. solution were allowed to stand over night with 2·5 c.c. of hydrochloric acid of 1·1 specific gravity, the solution neutralized with soda, made up to 100 c.c. and titrated. The polarimeter, however, showed that no reducing sugar had been formed, and therefore no saccharose was present in the sample. Though the 5 per cent. syrup solution showed on the day after its preparation, a rotation of + 21·9 Ventzke (length of tube = 2 decimetres), only 1·5 per cent. of dextrose anhydride, corresponding to a rotation of + 4·9 Ventzke, had been found. This led the author to suspect the presence of very impure starch-sugar containing amylin, which was confirmed in the following way: Ten grammes of the sample were dissolved in water, neutralized while hot with precipitated calcium carbonate, filtered hot, the precipitated calcium citrate with the excess of carbonate washed with boiling water, the filtrate cooled and fermented with must. It was then neutralized while hot, evaporated, treated first with lead acetate and then with sodium sulphate, made up to 100 c.c. and filtered. The liquid showed after four hours as well as after twenty-four hours a rotation of + 21 Ventzke = + 7° 17′ (2 decimetre tube), whilst its power of reducing was equal to 0 65 gramme dextrose anhydride in 100 c.c., corresponding to + 2 Ventzke.

The glycerin was tested for by the German official method for the analysis of dry wines, but none was found.

In analyses of lemon-juice the following results were obtained:

LEMON SYRUP.

100 Grammes contained	I.	II.	III.
Citric acid	6·75	14·40	5·42
Tartaric acid	10·58	Nil.	10·70
Reducing-sugar reckoned as dextrose	—	30·10	38·42
Saccharose	—	Nil.	Nil.
Amylin	—	Present.	Present.
Total extract	—	81·92	80·56
Extract minus citric and tartartic acids and reducing-sugar	—	37·42	26·02
Mineral matter (ash)	—	0·32	0·72
Polarization, Ventzke (length = 2 decimetre tube)	—	+ 21·9	+ 19·0

LEMON JUICE.

100 Grammes contained	Ripe Fruit.	Unripe Fruit.
Citric acid, calculated from acidity	7·25	7·70
Citric acid, precipitated as calcium salt	7·28	7·52
Tartaric acid	Nil.	Nil.
Reducing-sugar	0·75	0·21
Saccharose	0·19	0·78
Ash	0·384	0·486
Total extract	8·87	9·30
Extract minus citric acid and varieties of sugar	0·68	0·61
Observed rotation	− 1·7 (− 0° 36′)	+ 1·3 (+ 0° 27′)
Polarization corresponding to the saccharose	+ 0·7	+ 3·0
Polarization of the reducing-sugar { found	− 2·4	− 1·7
Polarization of the reducing-sugar { required	− 0·9	− 0·26

THE COTTON-SEED OIL INDUSTRY IN GEORGIA.[1]

By Joseph Jacobs.

I have thought that our Association, in this section especially, might profitably from year to year devote some of its time to the consideration of some of the industries that produce the articles that form or which might form the subject-matter of the drug trade, directly or indirectly.

In the present paper I shall endeavor to give some account of the cotton-seed oil industry, confining the statistical portion of the article mainly to my own State, Georgia, as this is one of the typical Southern States, and what is said in that connection is measurably true of the other Southern States of our Union; though the industry is by no means confined to the South.

While the Southern States of our country now principally supply the world with cotton, the cultivation of the plant is not at all confined to that section. Egypt, India, Australia, portions of China and many of the States of South America, as well as many of the islands of the seas, cultivate the variety of the Gossypium plant, known by the common English name "cotton."

There are some who suppose that the use of cotton as a mate-

[1] Read at the Baltimore meeting of the American Pharmaceutical Association.

rial for fabrics began with the introduction of slavery in this country, but the history of the plant shows that many of the ancient nations were skilled in the weaving of cloths from this fleece of the fields, and authoritative writers state that long before the Christian era, the older peoples of the East could weave it into filmy fabrics of far more delicate texture than even those of the finest of this day.

It is said that the value of the seed known to the ancients was both in the oil and the meal; that the oil was used, but not for its edible purposes, and that the crushed seed were fed to their cattle. The Chinese, it is related, expressed the oil from cotton seed at least 500 years before Christ.

In England there are now about twenty-five oil mills in operation, consuming principally black seed of the sea-island plant transported in ships from Egypt, and the Hollanders are, perhaps, as largely engaged in the industry. The oil has been made in those countries for many years.

The superiority of the oil made in our Southern States is due partly to the fact that the seeds can be secured fresh from the fields, near the oil plants, whereas in England and Holland some months are often required to bring them over in sailing vessels. Besides, the English and Holland oil is not so clear as ours, because the seed there treated is Egyptian or Indian, and is not decorticated, owing to the difficulty of picking it. Our cotton-seed parts with its fibre more readily, and in every way yields better to treatment.

The first mill for the manufacture of the oil in this country was, perhaps, the one near Columbia, S. C., mention of which is found as early as 1826; though it was probably operated prior to that date. One of the mills in New Orleans before the war used a 35 horse-power steam press, producing 500 gallons of oil and 5 tons of oil cake a day. It required, as stated in the *Southern Farmer and Planter*, about 15 tons of cotton-seed to produce this amount of oil and cake, or each ton yielded about 40 gallons of oil and 700 or 800 pounds of cake. In Memphis, Tenn., it was also made in large quantities. At this period we find the following published statement of the uses of the oil: "This oil, refined by a secret process, is made of two qualities—the best used for illuminating and lubricating purposes and for currying leather, and the inferior

for making soap equal to the palm soap." Cotton-seed cake was then considered of about equal value with flax-seed cake.

Prior to the war the cotton seeds were very little used as a stock feed. Some farmers sparingly used them after boiling. They were abundantly applied as a manure, but only in their uncrushed condition. Browne, in his "Field Book of Manures," says: "They abound in a mild oil, and are accounted very nutritious after the oil is expressed, a bushel of seeds weighing 30 pounds, and yielding 2½ quarts of oil and 12½ pounds of fine meal. The oil cake is very brittle, and breaks down much more readily than linseed cake. The taste is not unpleasant, and it is stated it can be used with success in fattening stock."

In the Patent Office Reports, 1855, p. 234, can be found "some chemical researches on the seed of the cotton plant," by Prof. Chas. T. Jackson. He refers to a patent taken out by D. W. Mesner for separating the "hulls" from the cotton-seed. Analyses are given of the oil, the seed, the cake, etc. Professor Jackson employed ether to separate the fixed oil, and it was found that 100 pounds of the dried, pulverized seed gave 40 per cent. of pure, fatty oil. The specific gravity of the oil is given as 0·923, which, he states, is the specific gravity of pure whale oil. He recommended its use for lubricating machinery, burning in lamps and for making soaps, and suggested its use as a substitute for olive oil and use as a salad oil, it having no disagreeable odor or taste. On examining the cotton-seed oil cake, he found that it possessed "a sweet and agreeable flavor, and was much more pure and clean than linseed oil cake." One hundred grains of the seed leave 60 grains of the oil cake. This cake examined for sugar was found to contain 1·1 grains, and for gum 35 grains. Iodine gave no proof of any starch in the cotton seed, nor in the oil cake.

Since the war, the cotton-seed oil industry of the South has grown to immense proportions. The number of mills has increased from four in 1867 to over 300 at the present day. In 1872 the export of cotton oil only amounted to 4,900 barrels; in 1896 about 30,000 barrels, and the present product amounts to about 28,000,000 gallons per annum, worth about 30 cents per gallon, causing the consumption of about 800,000 tons of cotton seed. The product goes to nearly every European port, to Africa, Australia, India, the South American Republics, West Indies and Canary Islands

and Japan. The Germans and Americans are said to prefer animal fats to vegetable oils, contrary to the taste of all other civilized people. The capacity of the various mills varies from a consumption of 250 tons a day by the larger mills to 15 tons by the smaller. The total capacity of the Georgia mills is about 2,000 tons a day, which, if run on full time, would consume more than the total seed product of that State if all were available; but the fact is that much of the seed used by the Georgia mills is brought from Alabama, Mississippi, Florida and the Carolinas. The annual output of Georgia from the 200,000 tons of seed, is about 150,000 pounds of oil, 70,000 tons of meal, 8,000 bales of linters and 80,000 tons of hulls. The average value of the annual product is about $2,750,000.

I have thus endeavored to give some of the facts connected with cotton-seed oil, its history and its quantity and production, in the hope that our trade may find it a profitable product to deal in. I will now enumerate some of the uses to which it has been applied, hoping that they may suggest others even more in line with our especial interests.

The principal use to which it is put is for food purposes. The claim that it is more healthful than many animal fats has been largely responsible for its extensive adoption in this connection. Nearly seven-eighths of the 28,000,000 gallons produced per annum probably find their way into "refined lard" and salad and cooking oil. It is used for illuminating, in the manufacture of bolts and nuts; for all kinds of soap, bath, laundry and toilet soap. It is used as a substitute for olive oil as an emulsion in medicine; it has been prescribed as a substitute for cod-liver oil, and for olive oil in packing sardines, and in many other ways. It is said that its non-drying properties debar its use as a wood filler, or for stuffing hides in making morocco and other leathers. No treatment has as yet been discovered which will give it the "drying" properties of a good menstruum for paints. As a soap for woolen mills, it has been extensively adopted in America, England and Scotland.

As an illuminant, a writer claims that its place is midway between sperm and lard oil. It can be burned alone or mixed with petroleum. On the coast of Maine there are a number of establishments shipping "sardines" and "shadines," which are said to be cooked

and then placed in boxes containing cotton-seed oil; and it has been charged that of the immense quantity of sardines exported from France and other European countries, largely more than three-fourths are now treated with cotton-seed oil instead of olive oil, as was formerly the exclusive practice. It has been suggested that the oil could be used in candle-making and for steel tempering.

By the time of the next meeting of our Association, I trust that this abundant and interesting American product may be fully treated by some of our members in a paper from a scientific standpoint, in which many new and valuable pharmacal uses may be pointed out.

GILLENIA TRIFOLIATA.[1] (INDIAN PHYSIC.)[2]

The histories of plants are not complete without an account of the personalities connected with them. Indeed, the individuals who have had part in bringing to our special notice a plant or its relations to humanity, seem to us as if they were an essential part of the whole story. Very often the generic or specific name of a plant is given in honor of some individual, and we naturally desire to know in what respect he deserved the honor. *Gillenia* would seem, from its construction, to be the Latinized form of some one's name; but no satisfactory explanation has been offered. The plant, itself, has been long known to botanists, as it was among those sent to Europe, in 1680, by the Reverend John Banister; but it was classed with the *Spiræa* family; at least, to that section of the *Spiræa* family known, at that time, as *Ulmaria*. Morison, who published a history of plants, in 1715, before the binomial system was introduced by Linnæus, described it as *Ulmaria Virginiana trifolia, floribus candidus amplis longis et acutis*, and Linnæus, himself, having in his earlier works united *Ulmaria and Spiræa*, describes it as

[1] *Gillenia Trifoliata*, Moench, natural order, Rosaceæ.—Leaflets ovate-oblong, acuminate; stipules linear-setaceous, entire; flowers on long pedicels, in pedunculate, corymbous panicles. A handsome herb, two to three feet high, slender and nearly smooth; lower leaves petiolate; leaflets two to four inches long, one-third as wide, pubescent beneath, sub-sessile. Flowers axillary and terminal. Petals rose-color or nearly white, eight lines long by two wide. Seeds brown and bitter. Wood's *Class-Book of Botany*. See also Gray's *Manual of the Botany of the Northern United States*, and Chapman's *Flora of the Southern United States*.

[2] *Meehans' Monthly*, 1898, p. 127.

Spiræa trifoliata, foliis ternatis serratis subæqualibus floribus subpanicalatis. In establishing the binomial system, his evident practice was to retain the first or last term for his specific name. Though not always appropriate, this method preserved the connection of the plant with its earlier history. In this case, the term *trifoliata* is sufficiently appropriate. It continued as *Spiræa* until 1802, when Conrad Moench, in a supplement to a local flora of the city of Marburg, in Austria, noting its tubular campanulate seed vessel, included stamens, and its peculiar carpels, named it *Gillenia*, as distinct from *Spiræa*, which determination has been accepted by subsequent botanists. But why he named it *Gillenia*, has been a matter of doubt. The author of this chapter has not had access to the original work of Moench. Indeed, beyond the fact that he was a Professor of Botany somewhere in Hesse Cassel, and that he was the author of a few local Floras, little is known of him. Of Gillen, if there ever was a person by this name, nothing is known. Paxton, in his Dictionary, says, the plant was "named by Moench, probably after Gillen, some obscure botanist." The always-careful Darlington says, "Derivation of the name not well ascertained." Dr. Asa Gray has it that it was "dedicated to an obscure German botanist or gardener, A. Gille, or Gillenius." The "Century Dictionary" enlarges a little on this and says, "named after Dr. Arnold Gill (Latinized Gillenius), a German botanist;" and it gives the pronunciation Ji-lé-ni-a. There are good philological reasons against the latter suggestions. Wood brushes away the whole line of argument, and suggests the derivation from a Greek word signifying hilarity, from the well-known use of the plant by the Indians, but even here the orthography—two l's being employed in the name—is against the conjecture. It is most reasonable that the genus was named *Gillenia* in honor of some good cultivator of plants at Marburg. The city was, in Moench's time, a famous seat of learning, with reputable schools and colleges; while the gardens of its citizens were filled with rare plants from many countries.

The *Spiræa trifoliata* was, in the language of Sims, "a plant much coveted, increasing but little, propagated with difficulty, and liable to be lost unless placed in soil and situation highly favorable to it. It is scarce in the gardens about London." This was in 1796. Moench was writing a *Methodus* or arranged account of the plants found in the fields and gardens of Marburg—and there is

FIG. 1.—Lower portion of a flowering stem of gillenia trifoliata, from a plant growing on the Wissahickon, near Philadelphia.

little difficulty in believing that he would name the plant in honor of the one in whose garden the rare opportunity of examining it was afforded. May we not say "*Gillenia*—in honor of a grower of rare plants at Marburg in Austria?"

In recent times trouble has arisen in regard to the names of plants from the fact that species, supposed to be distinct and named as such, have been referred subsequently to one species. In these cases the rule proposed was that the oldest name should prevail. But in many cases the newer name has widely prevailed before the older was noted. The recent effort has been to insist on the older name, and a new rule proposed that a name once used should not be employed again. As it is expressed "once a synonym, always a synonym." The current is not running smoothly in this direction, and our plant has been dragged into the whirlpool. In Britton and Brown's recent work, the "Illustrated Flora of the Northern States," *Gillenia* is dropped, and it appears as *Porteranthus;* the name being given by Prof. Britton in honor of Prof. Thomas C. Porter. The reason given for this is that Adanson gave the name *Gillena* to a genus which proved to be the same as *Clethra. Gillena* thus became a synonym which Britton and Brown regard as ineligible. But even under this rule the change seems unjustifiable. *Gillena* is not *Gillenia.* If a difference in spelling, though but in a single letter, is to make a name synonymous, many changes will have to be made in other things. The new name, *Porteranthus* might even be questioned, as *Porterella* has been employed before, though, to the regret of all who would see Professor Porter's eminent services to botany honored, it has been pronounced synonymous with another campanulaceous plant. *Gillenia* will probably prevail for our plant.

As already noted, it was known to English botanists early in the seventeenth century; but cultivators, according to a reference in "Philosophical Transactions," n. 337, p. 214, n. 134, are indebted to the famous amateur gardener, Henry Compton, Bishop of London, in the garden of whose palace at Lambeth it was found growing at the time of his death, in 1713.

The common name, "Indian Physic," refers to its use among the Indians. Some authors say that it was customary for some tribes of Virginia Indians to meet together once a year, and go through a regular system of purification, accompanied with peculiar religious

services. At these times, the pounded root of this plant was the chief emetic. Clayton to Gronovius, in his report on Virginian plants, says it is "Ipecacuanha, or Indian Physic." As Ipecacuanha is believed to be a Brazilian term, signifying a "sick-making" plant, it is probably an application by the white settlers to this plant. It would be a connecting link between the Virginia Indians and those of South America, if this term were common to both. In noting its properties, Griffith says, in "Medical Botany," "It early attracted the attention of botanists, who found it well known to the Aborigines as a certain and safe emetic. It is a curious fact, connected with our *Materia Medica*, that there is scarcely any plant having remedial powers with which the Indians were not well acquainted before any communication with the whites; while there is scarcely one indigenous remedy that has been the result of scientific research"—a remark that may be applied to many things besides medical knowledge. In regard to its worth, Dr. Griffith says that, after Baum had regarded it as of no merit, he examined it carefully, and concluded that there could be no doubt of its value. The dose given is thirty grains, persisted in till vomiting takes place.

Besides Indian Physic, a popular name is "Bowman's Root"—not from any individual of that name, but as synonymous with Indian—the man who uses the bow.

When growing in large masses, as it is occasionally found, it does not present the same pretty effect as when individual plants are growing among sedge-grasses, ferns and other green vegetation. The light color of the flowers, amidst so much verdure, then shows to great advantage. This is the condition in which it is generally found. It occurs sparingly beyond the Alleghanies. It seems most at home in New York, Pennsylvania and thence to Virginia, becoming scarcer till Northern Alabama is reached, which seems its southern limit.

A New Morphine Derivative.—Merck prepares benzyl morphine by the action of benzyl chloride on morphine in the presence of alkali in alcoholic solution. The resulting benzyl morphine is converted by HCl into the hydrochloride. This new salt forms shining prisms, soluble in most organic solvents. Its formula is $C_{17}H_{18}NO_2.O.CH_2C_6H_5HCl$. It is suggested as a substitute for codeine (methyl morphine).=*Brit. and Col. Drug.*, 1898, p. 773.

QUALITATIVE EXAMINATION OF POWDERED VEGETABLE DRUGS.[1]

By Henry Kraemer.

In this communication is embodied the principles of a scheme for the determination of unknown powders. While the paper has primarily to do with the consideration of *official vegetable drugs*, still it has been found necessary to incorporate with it also the important *non-official vegetable drugs* and *food products*, as well as the *pulveres* (composed of inorganic and vegetable substances), some of the *compound powders* for making various preparations, and all of the principal *plant constituents*, as opium, guaiac resin, etc. The proximate principles of plants, other than starch, have been omitted, owing to the fact that they require a somewhat different treatment. Somewhere in the neighborhood of 300 powders are considered. The whole scheme is but tentative, and will doubtless require some changing, but gives us a basis for subsequent work, at least. It has not been possible, up to the present time, owing to the pressure of duties, to finish the drawings for publication of the points considered, but even without these, those who are familiar with the microscopical characteristics of crude drugs and the general principles of chemical analysis will find little or no difficulty in the utilization of the same. The drugs under consideration are divided, according to the varying shades of color, into seven classes:

I. Color, some shade of light green to gray.

II. Color, nearly white.

III. Color, some shade of yellow.

IV. Color, varying from some shade of tan or ecru to dark brown, or even dark blue or black.

V. Color, some shade of red.

VI. Powders that vary in fineness from Nos. 20 to 30 or less, and are with difficulty examined by means of the microscope without further treatment, as sectioning, etc.

VII. Drugs that do not occur in the powdered condition.

The author was some time in coming to the conclusion that powdered drugs could be arranged along color lines before taking them up scientifically for identification. It is true it is necessary to arrange samples of the powders in convenient vials and mount on white cardboard to appreciate the ground for the classification

[1] Given in abstract at the Baltimore meeting of the A.Ph.A.

adopted. It will also be found that there are a few of the powders under the different groups, as No. I, that might be considered advantageously under others, as No. IV. In such cases samples must be arranged under both, and this has been done as far as possible by the author.

The largest groups are Nos. I and IV, and it will be found that they include a more natural grouping than we would at first suppose. Under No. I we find chiefly the herb and leaf drugs, while under No. IV are chiefly roots, rhizomes and barks. It has been found necessary, owing to the difference in predominating constituents or tissues, to work up each group differently.

GROUP NO. I. COLOR GREEN TO GRAY.

Coca, Buchu, Mentha viridis, Matico, Chelidonium, Guaiaci resina, Gaultheria, Lobelia (herb), Passion flowers, Pulsatilla, Pilocarpus pinnatifolius, Lobelia (leaves), Buchu (long), Calumba, Eucalyptus, Absinthium, Pilocarpus, Senna (Alexandria and India), Scutellaria, Castanea, Eupatorium, Tanacetum, Mentha piperita, Lobelia, Anisum, Fœniculum, Conium, Belladonnæ folia, Coca, Insect powder (Persian), Salvia, Eriodictyon, Hamamelis, Matico, Uva ursi, Scoparius, Grindelia robusta, Chimaphila, Gaultheria, Hyoscyamus, Stramonii folia, Galla (Chinese or Japanese), Cypripedium, Aletris, Digitalis, Marrubium, Piper nigrum, Ergota, Hedeoma, Sarsaparilla (Mexican), Cimicifuga, Spigelia, Leptandra, Arnicæ radix, Chenopodium, Sarsaparilla (American), Xanthoxylum fraxineum, Xanthoxylum Americanum, Aralia spinosa, Senega, Sarsaparilla (Honduras), Sumbul, Taraxacum, Serpentaria, Piper album, Aurantii amari cortex, Aurantii dulcis cortex, Limonis cortex, Helonias dioica, Caulophyllum, Angelica, Kava kava, Nux vomica, Belladonnæ Radix.

I. WITHOUT FIBRO-VASCULAR TISSUE.

1 *Ergota.*—Oil globules; red or violet coloration in chloral and sulphuric acid; odor.

II. WITH FIBRO-VASCULAR TISSUES.

A. WITH CALCIUM OXALATE CRYSTALS.[1]

[1] If there are any doubts about the presence of calcium oxalate crystals, sulphuric acid may be added to the powder when numerous needle-shaped crystals of calcium sulphate will generally separate. It must be also stated that in plants containing calcium oxalate the form may be in needles in addition to the characteristic form given.

a. CRYSTALS ROSETTE OR STAR-SHAPED.

a. Containing starch.[2]

2. *Aralia nudicaulis.*—Crystals 35–70 μ; starch, 10–15 μ; secretion reservoirs (yellow and brown); sklerenchyma.

3. *Aralia spinosa.*—Crystals about 50 μ; starch about 10 μ; reservoirs containing oil and resin; cork brownish; sklerenchyma fibres; also sometimes fine needle-shaped crystals.

4. *Galla (Chinese or Japanese).*—Few crystals, 20 μ; starch 40 μ; non-secreting hairs; milk vessels accompanying ducts; mounts in glycerin show acicular crystals of gallic acid.

5. *Passion Flowers.*—Crystals 15 μ; starch; pollen 35–45 μ; sklerenchyma.

6. *Podophyllum.*—Crystals 50 μ in diameter; starch 5–8 μ diameter; single grains to 2–6 compound; numerous single or groups of cells colored yellow; sklerenchyma fibres and ducts.

7. *Spigelia.*—Crystals 5–15 μ; starch 4 μ; parenchyma and long light colored sklerenchyma fibres characteristic; apparently at one stage or in an admixed drug calcium carbonate is present

β. Without starch.

8. *Anisum.*—Crystals 2–3 μ in aleuron grains 6 μ in diameter; non-secreting hairs; secretion reservoirs; epidermis of seed coat and pericarp characteristic.

9. *Buchu.*—Crystals 15–20 μ; sphere-crystals of a carbohydrate 35 μ; mucilage; sklerenchyma very characteristic; non-secreting hairs; heavy cuticle; oil secretion reservoirs.

10. *Castanea.*—Crystals 15 μ; wavy epidermis; sklerenchyma; some pollen grains; presence of few or no non-secreting hairs distinguish it from *Castanea pumila.*

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[2] If there are any doubts about the presence of starch, the reaction for which is sometimes hid by the presence of resinous or other principles, a small quantity of the powder may be boiled for a minute with a few drachms of water in a test-tube, the liquid filtered and tested with iodine and potassium iodide solution.

Regarding the presence of reserve starch and calcium oxalate crystals in plants, the amount of these constituents is an uncertain one owing to the changes induced by certain Fungi. J. H. Wakker, in *Pringsheim's Jahr. f. Wissensch. Bot.*, xxiv, p. 499, states that he found in Rhamnus frangula the calcium oxalate crystals to be fewer and the starch grains more numerous when plants were diseased. See also *Hartig's Lehrbuch der Baumkrankheiten* and Byron D. Halsted's paper before the A. A. A. S., 1898.

11. *Cannabis Indica.*—Crystals 20 μ; characteristic crystolith (200 μ long) with or without broad base (containing $CaCo_3$ in granular masses) attached; oil secretion hairs; characteristic cells of pericarp.

12. *Chimaphila.*—Crystals 55 μ; tannin masses; chimaphilin, red with H_2SO_4.

13. *Conium.*—Crystals 2 μ in aleuron grains about 5 μ; no oil secretion reservoirs of Umbelliferæ; characteristic outer epidermis of seed coat and pericarp; odor alone or when rubbed with KOH.

14. *Eriodictyon.*—Crystals 20–25 μ; long 1-celled, non-secreting hairs; also secreting hairs.

15. *Eucalyptus.*—Three kinds of crystals, rosette shaped, 15 μ diameter, tetragonal 4 x 14 and 25 x 15 μ; thick, greenish cuticle; oil secretion reservoirs and characteristic sklerenchyma.

16. *Fæniculum.*—Crystals 2 μ in aleuron grains about 6 μ; oil secretion reservoirs with characteristic inner epidermis of pericarp running at right angles to length of the former; peculiar thickened latticed parenchyma.

17. *Gaultheria.*—Crystals 20 μ, look as though made up of little plates; stomata numerous with 2 "Nebenzellen;" tufts of fan-shaped crystals (28 μ); stone cells with reddish coloring matter; in chloral glycerin some tissue colored purplish; with Fe_2Cl_6 tannin and oil colored dark purple.

18. *Hedeoma.*—See No. 57. In glycerin mounts have sphere-shaped crystals separating.

19. *Insect Powder.*—Pyrethrum roseum, or Persian—numerous rounded and prickly pollen grains, 25 μ; some few crystals (2 x 8 μ), in stone or in parenchyma adjoining; sklerenchyma fibres being 17 x 105 μ, and 20 x 160 μ, in Dalmatian; fragments of T-non secreting hairs less numerous than in Dalmatian; characteristic, isolated, somewhat rounded or elliptical parenchyma cells (75 x 95 μ), also occurring in papillæ-like fragments. Fragments of papillæ (epidermis of corolla), acute and more numerous than in Dalmatian. In latter rounded and scarcely perceptible; secretion hairs 50 μ, being smaller than in Dalmatian; rose colored fragments in chloral mounts possibly more numerous in the Persian powder.

20. *Pilocarpus.*—Crystals 17 μ; few non-secreting hairs; long sklerenchyma fibres; oil secretion reservoirs; few palisade cells.

21. *Senna.*—Possesses four kinds of crystals—rosette, cubical, te-

tragonal and coffin-shaped, of which the rosette occurs least, and the other three in greatest amount; 1-celled hairs more numerous in Alexandria than in India senna. Boil a small quantity with water, filter and to the light lemon-colored filtrate add KOH and solution becomes red, due to chrysophanic acid reaction.

22. *Stramonii Folia.*—Crystals 10–15 μ, occurring in a characteristic line through the middle of the leaf just below the palisade cells; some secreting and non-secreting hairs.

b. CRYSTALS CUBICAL, RHOMBOHEDRAL, PRISMATIC, TETRAGONAL OR COFFIN-SHAPED.

a Containing Starch:

23. *Cardamom.*—Crystals very small; starch in single small grains, and in masses; fragments of thick, dark sklerenchyma cells being the outer and particularly inner epidermis of seed coat. The Malabar is distinguished from the Ceylon in that the latter has a few 1-celled hairs, the starch grains and crystals are larger and sklerenchyma cells are more prominent.

When the pericarp or fruit wall is present, this is determined by its large parenchyma cells containing brown masses; also sklerenchyma fibres.

24. *Calumba.*—In the stone cells are cubical crystals 15 μ; starch grains characteristic, 35 x 25 μ.

25. *Gelsemium.*—Crystals of three kinds; diamond-shape, 15 x 15 μ, tetragonal, 15 x 20 μ or twin, large prismatic as in quillaja, 8 x 28 μ; starch, 8 x 8 μ; numerous sklerenchyma fibres. In overground stem find remains of chloroplastids in collenchyma; root distinguished from stem by absence of fragments of altered sieve (*i.e.*, internal phlœm).

26. *Guaiaci Resina.*—See note No. 94.

27. *Pulv. Glycyrrhizæ Co.*—Cubical crystals 3 x 2 μ in crystal fibres in fragments of about 117 μ in length; starch about 5 μ in diameter; characteristic crystals and hairs of senna (see No. 21). The powder made from Russian licorice contains few or no fragments of cork.

28. *Spigelia.*—See No. 7.

29. *Xanthoxylum.*—Crystals 7 x 10 μ; starch 10 μ; oil secretion reservoirs; in chloral mount numerous oil globules; sklerenchyma cells and fibres in *X. fraxineum.*

β. Without Starch:

30. *Coca.*—Crystals cubical 3 x 3 μ, coffin-shaped, 3 x 10 μ; peculiarity of epidermis; absence of hairs; *odor.*

31. *Eucalyptus.*—See No. 15.

32. *Gaultheria.*—See No. 17.

33. *Hamamelis.*—Crystals 7–10 μ; 1-celled non-secreting hairs; tannin and resin masses.

34. *Hyoscyamus.*—Crystals of two kinds—rosette-shaped and more or less cubical (10 x 10 μ), the latter chiefly. Numerous secreting and non-secreting hairs.

35. *Senna.*—See No. 21.

36. *Stramonii Folia.*—See No. 22. The rosette-shaped crystals are generally in greater abundance.

37. *Uva Ursi.*—Prismatic and coffin-shaped crystals (7 x 10 μ), in crystal fibres; tannin masses; characteristic sklerenchyma fibres; no oil-cells or reservoirs.

c. CRYSTALS ACICULAR (RAPHIDES).

38. *Cypripedium.*—Crystals 35–58 μ long; starch 2–4 μ; root hairs; oil and resin cells; characteristic odor.

39. *Helonias.*—Characteristic small acicular crystals (35 μ long) in small groups; starch.

40. *Sarsaparilla.*—Crystals 68 μ long; starch 10–20 μ; sklerenchyma fibres. In Mexican sarsaparilla find a pronounced yellowish hypodermis and endodermis, the walls of which are unequal in thickness. In Honduras the latter is not so pronounced. Starch in both rather characteristic.

Needle-shaped crystals other than calcium oxalate are sometimes found in the following:

41. *Buchu.*—See No. 9.

42. *Coca.*—See No. 30.

43. *Chelidonium.*—See No. 52.

44. *Gaultheria.*—See No. 17.

45. *Lobelia.*—See No. 61.

d. CRYSTALS AS FINE SAND-LIKE PARTICLES IN PARTICULAR CELLS. LIKELY TO FIND ALSO ACICULAR CRYSTALS.

46. *Belladonnæ Folia.*—Characteristic grayish or dark-colored cells containing small angular crystals of calcium oxalate; few secreting and non-secreting hairs.

47. *Dulcamara.*—Crystal-sand; starch, 5–7 μ; acicular crystals in parenchyma of bark; ducts with bordered pores; ducts 35–45 μ in width, and accompanied with sklerenchyma fibres; occasional single bast fibre; cork.

B. CALCIUM OXALATE CRYSTALS FEW OR WANTING.

a. Simple hairs present:

48. *Absinthium.*—T-non-secreting hairs; secreting hairs.

49. *Belladonnæ Folia.*—Might be considered here as crystal-sand could be overlooked. See No. 46.

50. *Buchu.*—See No. 89.

51. *Castanea.*—See No. 10.

52. *Chelidonium.*—Non-secreting hairs; milk vessels contain reddish masses; epidermis with papillæ and cells with sinuate margins on surface view; acicular crystals sometimes observed in glycerin mounts.

53. *Digitalis.*—Characteristic non-secreting and secreting hairs; stomata each with 4–5 nebenzellen.

54. *Eriodictyon.*—See No. 14.

55. *Eupatorium.*—Non-secreting and secreting hairs; pollen grains 15 μ; characteristic style.

56. *Galla.*—See No. 14.

57. *Hamamelis.*—See No. 33.

58. *Hedeoma.*—Non-secreting hairs, 2-3-celled; peculiar thickened or reticulated cells of anther; in glycerin mounts, crystals of carbohydrate in "Athemhöhle."

59. *Insect Powder.*—See No. 19. Crystals may not be observed.

60. *Hyoscyamus.*—See No. 34.

61. *Lobelia.*—Non-secreting hairs; sklerenchyma; pollen grains 30 x 15 μ; reticulated seed coat. Leaves distinguished from herb in that in the former fewer pollen grains and seeds are present.

62. *Matico.*—Non-secreting hairs of two kinds, few short, but numerous long and peculiarly jointed; oil secretion reservoirs, numerous in tissues of fruit; spiral ducts; pollen grains nearly cubical; much sand in among the fruit fragments.

63. *Marrubium.*—1–4-celled, non-secreting hairs, either single or in groups; large oil-secreting hairs.

64. *Mentha Piperita* and 65. *Mentha Viridis.* In chloral mount violet-colored fragments of petals; pollen grains; jointed non-secreting and secreting hairs. In Men-

tha piperita sometimes find in the secretion hairs crystals of Menthol. Non-secreting hairs peculiar and apparently more abundant in Mentha viridis than in M. piperita; taste test characteristic for each.

66. *Nux Vomica.*—Non-secreting hairs give the characteristic reaction for lignin; endosperm, with thick walls, contains oil and protein; blue with $H_2SO_4 + K_2Cr_2O_7$.

67. *Pulsatilla.*—Non-secreting hairs, long and 1-celled; sklerenchyma (mechanical cells).

68. *Salvia.*—Non-secreting hairs; 1–4-celled and jointed; also two kinds of non-secretion hairs; stomata, each with two "Nebenzellen."

69. *Scoparius.*—Non-secreting hairs; pollen grains are cubical and may be mistaken for crystals; sklerenchyma with brown contents in lumen.

70. *Scutellaria.*—Non-secreting hairs long, jointed (5 cells); two kinds of secretion hairs; sklerenchyma characteristic and prominent.

71. *Senna.*—See No. 21.

72. *Stramonii Folia.*—See No. 22.

73. *Strophanthus.*—Long secretion hairs, in diameter 10–15 μ; starch grains, 4 μ; parenchyma containing oil, aleuron and starch; narrow, almost colorless collapsed cells; Strophanthin reaction.

74. *Tanacetum.*—Characteristic, bent, non-secreting hairs, made up of 4–5 cells; pollen grains 15 μ; odor characteristic.

(*b*) CONTAINING SECRETION HAIRS OR RESERVOIRS; AROMATIC AND OF CHARACTERISTIC ODOR.

a. With oil-secreting hairs.

75. *Absinthium.*—See No. 48.

76. *Arnicæ Flores.*—Characteristic 5–6-celled, jointed, non-secreting hairs of corolla; also double hairs on outside of ovary; pappus; pollen grains; sklerenchyma.

77. *Belladonnæ Folia.*—See No. 46.

77*a*. *Digitalis.*—See No. 53.

78. *Eriodictyon.*—See No. 14.

79. *Eupatorium.*—See No. 55.

80. *Grindelia.*—Pollen grains, 20 μ; large number of palisade cells; sklerenchyma cells and fibres.

81. Hedeoma.—See No. 58.

82. Mentha Piperita and 83. Mentha Viridis. } See Nos. 64 and 65.

84. Pulsatilla.—See No. 67.

85. Salvia.—See No. 68.

86. Scoparius.—See No. 69.

87. Scutellaria. See No. 70.

β. Containing secretion reservoirs:

88. *Angelica.*—Starch; size of parenchyma cells containing starch characteristic; sklerenchyma; odor.

89. *Arnicæ Radix.*—Inulin masses or crystals soluble in hot water; sklerenchyma fibres; resinous masses.

90. *Caulophyllum.*—Parenchyma cells containing starch characteristic; sklerenchyma; odor.

91. *Cimicifuga.*—Reserve starch; sklerenchyma fibres; ducts.

92. *Eucalyptus.*—See No. 15.

93. *Gaultheria.*—See No. 17.

94. *Guaiaci Resina.*—Numerous lemon-yellow or dark brown resin masses, which on mounting in chloral have a wine-colored halo around them; few fragments of tissues, with characteristic sklerenchyma cells and fibres; few crystals of calcium oxalate (cubical or coffin-shaped) in parenchyma.

95. *Kava Kava.*—Starch; yellowish resin and oil; sklerenchyma more of nature of that found in fruits and seeds.

96. *Leptandra.* Starch characteristic; brown stone cells.

97. *Matico.*—See No. 62.

98. *Pilocarpus.*—See No. 20.

99. Piper Album and 100. Piper Nigrum. } Starch and oil in perisperm; stone cells. Piper album has fewer stone cells than Piper nigrum.

101. *Sabina.*—Starch, 4 μ; characteristic hypodermis, consisting of long fibres (15 μ wide), associated with epidermis.

102. *Sumbul.*—Starch; sklerenchyma fibres numerous.

103. Tanacetum.—See No. 74.

C. SKLERENCHYMA CELLS (STONE CELLS) OR FIBRES (WOOD OR BAST).[1]

104. *Aletris.*—Starch; yellowish or reddish-yellow colored sklerenchyma.

105. *Arnicæ Radix.*—See No. 89, sklerenchyma fibres.

106. *Calumba.*—See No. 24, stone cells.

107. *Cimicifuga.*—Starch; resin cells; sklerenchyma fibres; ducts.

108. *Chenopodium.*—Characteristic reddish-brown pericarp and seed coat; numerous starch grains, in size up to 10 μ; fine granular contents = aleuron.

109. *Chirata.*—No starch; few small pollen grains, 4 x 10 to 7 x 10 μ; parenchyma large, with simple pores; many sklerenchyma fibres, in width 20 μ, walls 4 μ thick; scalariform ducts, 30 μ in width, also isolated spiral ducts; yellow epidermis, with some collenchymatic parenchyma, latter with brown contents; with the latter are associated mycelial-like development, containing blackish-brown colored substance; few seeds in shape like Hyoscyamus, and reticulated like Lobelia, but cells larger and walls 4 μ thick.

110. *Cydonium.*—Without starch or calcium oxalate crystals; outer clear mucilage cells as in Linum; beneath the latter are thick-walled cells, containing brown contents, which react like tannin; parenchyma containing oil and aleuron.

111. *Grindelia.*—See No. 80, stone cells and fibres.

112. *Guaiaci Resina.*—See No. 94, very few stone cells and fibres.

113. *Lappa.*—Numerous irregular transparent fragments or sphere crystals (more or less fan-shaped) soluble in hot water = Inulin; no secretion reservoirs; more wood fibres and possibly larger reticulated ducts (as much as 70 μ wide) than Inula; cells of periderm brownish becoming yellow.

114. *Leptandra.*—Starch characteristic; brown stone cells.

115. Piper Album and 116. Piper Nigrum. } See Nos. 99 and 100, stone cells.

117. *Physostigma.*—Starch, 25 x 40 μ; oil and protein in irregular granular masses; characteristic sklerenchyma and stone cells whose contents are reddened by alkalies.

[1] If thought necessary, can isolate characteristic stone cells and sklerenchyma fibres by treatment of powder with Schulze's macerating fluid or sulphuric acid.

118. *Podophyllum.*—Crystals sometimes appear wanting; starch grains single (5–8 μ) or in groups of 4 to 6 grains; numerous single cells or groups with yellowish resinous contents; ducts and sklerenchyma fibres.

119. *Sarsaparilla* (*Honduras*) and 120. *Sarsaparilla* (*Mexican.*) } See No. 40.

121. *Senega.*—Parenchyma and sklerenchyma fibres characteristic; mounts in chloral show some pinkish (or strawberry-colored) cells.

122. *Scoparius.*—See No. 69.

123. *Scutellaria.*—See No. 70.

124. *Spigelia.*—Rosette crystals, 10–15 μ; tetragonal crystals, 3–10 μ; sklerenchyma fibres; parenchyma containing pink-colored contents; starch, 4 μ; peculiar hypodermis; may contain $CaCO_3$.

125. *Sumbul.*—Starch; resin secretion reservoirs; numerous sklerenchyma fibres.

(D) SEEDS WITH THEIR CHARACTERISTIC SEED COATS.

126. *Chenopodium.*—See No. 108.

127. *Lobelia.*—See No. 61.

(E) RESERVE STARCH.

128. *Aletris.*—See No. 104, sklerenchyma.

129. *Angelica.*—See No. 88, parenchyma, odor.

130. *Aralia nudicaulis.*—See No. 2, crystals.

131. *Aralia spinosa.*—See No. 3, crystals.

132. *Caulophyllum.*—See No. 90, parenchyma, odor.

133. *Chenopodium.*—See No. 108, stone cells.

134. *Cimicifuga.*—See No. 91, fibres.

135. *Cypripedium.*—See No. 38, crystals, resin.

136. *Helonias.*—See No. 39, crystals.

137. *Kava Kava.*—See No. 95, sklerenchyma.

138. *Leptandra.*—See No. 114, stone cells.

139. *Physostigma.*—See No. 119, sklerenchyma cells and fibres

140. *Piper Album* and 141. *Piper Nigrum.* } See Nos. 115 and 116, stone cells.

142. *Sarsaparilla (Honduras)* and 143. *Sarsaparilla (Mexican).* } See No. 40, sklerenchyma.

144. *Spigelia.*—See No. 124, parenchyma.

145. *Serpentaria.*—Starch, 10 μ, grains as a whole apparently larger than in spigelia; sklerenchyma fibres and ducts; many parenchyma cells contain a yellowish or reddish-brown substance, as also the cork cells.

146. *Sumbul.*—See No. 125, sklerenchyma fibres.

147. *Xanthoxylum.*—See No. 29.

(F) CONTAINING POLLEN GRAINS.

148. *Castanea.*—See No. 10, crystals.

149. *Chelidonium.*—See No. 52, milk vessels.

150. *Eupatorium.*—See No. 55, hairs.

151. *Grindelia.*—See No. 80, hairs and sklerenchyma.

152. *Hedeoma.*—See No. 58, hairs, stomata.

153. *Insect Powder.*—See No. 19, hairs and sklerenchyma.

154. *Lobelia.*—See No. 61.

155. *Marrubium.*—See No. 63, hairs.

156. *Mentha Piperita,* and 157. *Mentha Viridis.* } See Nos. 64 and 65, hairs.

158. *Passion Flowers.*—See No. 5, pollen.

159. *Pulsatilla.*—See No. 67, hairs.

160. *Scoparius.*—See No. 69, hairs.

161. *Scutellaria.*—See No. 70, hairs.

162. *Tanacetum.*—See No. 74, hairs.

G. INULIN MASSES OR CRYSTALS (SOLUBLE IN HOT WATER).

163.—*Arnicæ Radix.*—See No. 89, sklerenchyma and resin masses.

164. *Lappa.*—See No. 113, ducts and wood fibres.

165. *Taraxacum.*—Numerous crystal-like groups, or sphere-crystals, giving in glycerin mounts the parenchyma a characteristic appearance; yellowish-brown milk vessels 10 μ in width; reticulated ducts are 45 μ wide, and associated with them are characteristic non-lignified "Ersatzfasern."

H. CONTAINING TANNIN MASSES.

166. *Chimaphila.*—See No. 12, crystals.
167. *Galla.*—See No. 4, crystals and starch.
168. *Gaultheria.*—See No. 17, crystals.
169. *Hamamelis.*—See No. 33, crystals and hairs.
170. *Uva Ursi.*—See No. 37, crystals.

GROUP NO. 2. COLOR WHITISH.

Wheat flour, Corn starch, Wheat starch, Potato starch, Rice starch, Bermuda arrow root starch, Montserrat arrow root starch, Wheat middlings, Corn meal, Corn bran, Orris root, Resina jalapæ, Dextrin (white), Gum arabic (white), Tragacanth, Saccharum (cane), Sacch. Lactis, Scilla, Camphora, Talc, Prepared chalk, Ppt. chalk, Pulv. Cretæ Comp., $BaCO_3$, $BaSO_4$, $CaSO_4$, Heavy magnesia (MgO), Light magnesia (MgO), Antimony oxide, Antimonial powder, Tartar emetic, Calcium phosphate ppt. [Ca_3 $(PO_4)_2$], Terra alba, Potassium bitartrate.

I. PLANT TISSUES OR CELL CONTENTS RECOGNIZABLE.

A. CONTAINING STARCH.

a. Unaltered starch alone.—Grains characteristic for each; completely soluble in glycerin on heating, and precipitated on the addition of water.

171. *Arrow root starch* (Bermuda).
172. *Arrow root starch* (Montserrat).
173. *Corn starch.*
174. *Rice starch.*
175. *Wheat starch.*—Does not agglutinate on mixing with water distinction from wheat flour.

b. Altered and unaltered starch grains.

176. *Dextrin.*—Sticky mass with water; unaltered starch grains detected.

c. Plant tissues in addition to starch grains.—The former remain upon treatment with hot glycerin.

a. Do not readily dissolve or swell in cold water and become transparent and sticky.

177. *Corn meal.*—More starch and oil and little hull.
178. *Corn Bran.*—Less starch and oil and more hull.

179. *Wheat Flour.*—Agglutinates with water, distinction from wheat starch; little tissue of wheat grain.

180. *Middlings of Wheat.*—Starch and numerous fragments of tissues of wheat.

181. *Orris Root.*—Characteristic starch grains 15 x 15 to 15 x 30 μ; scalariform ducts 25 μ wide; no cork.

B. SOLUBLE OR SWELL IN COLD WATER TO FORM A STICKY MASS.

182. *Acacia* (white).—Soon affected by water; few plant tissues.

183. *Tragacanth.*—Slowly affected by water; fragments of ducts and parenchyma; more likely to find corn starch grains in commercial powder.

B. WITHOUT STARCH.

184. (*a*) *Acicular crystals.*

Squills.—Also find isolated fragments of fibro-vascular tissue.

II. ABSENCE OF PLANT TISSUES.

A. SOLUBLE IN WATER.

185. *Cane Sugar.*—Characteristic crystals; soluble also in mounts of glycerin and glycerin + chloral; taste.

186. *Potassii Bitartras.*—Soluble in water with acid reaction; with sodium cobaltic nitrite solution get small yellow cubical crystals, which are permanent in glycerin mount.

187. *Tartar Emetic.*—Large irregular masses; add HCl to the powder on a slide, and then pass H_2S over the same, get an orange-red precipitate, which is permanent in a glycerin mount.

B. INSOLUBLE IN WATER.

(*a*) Soluble in alcohol.

188. *Camphor.*—Liquefies in mounts of glycerin and chloral; glycerin mounts show irregular masses.

189. *Resina Jalapæ.*—In glycerin get irregular opaque fragments, which swell and by and by look like huge amœboid masses; in glycerin and chloral the fragments become rounded, transparent and finally dissolve.

(*b*) Insoluble in alcohol.

a. With H_2SO_4 *reddish color after some time.*

190. *Saccharum Lactis.*—Small and large irregular-shaped crystals, insoluble in mounts of glycerin or glycerin + chloral.

β. No color reaction with H_2SO_4.

* *Soapy feel.*

191. *Talc* (*or Magnesium Silicates*).—Rather lustrous long irregular crystals.

** *Effected by acetic acid.*

† *With effervescence.*

192. *Calcii Carbonas Præcipitatus* ($CaCO_3$).—Add hot solution of ammonium oxalate to acetic acid solution on slide, get crystals of calcium oxalate. Mount in glycerin and observe rosette or cubical crystals of a rather uniform size.

193. *Creta Præparata* ($CaCO_3$).—Same treatment as above, but CaC_2O_4 crystals are triangular and cubical and not of uniform shape.

194. *Pulvis Cretæ Compositus.*—On addition of acetic acid notice peculiar gummy mass containing crystals of sugar, which are soluble in water.

195. *Barium Carbonate* ($BaCO_3$).—Add H_2SO_4, and in glycerin mount the $BaSO_4$ precipitate is bacteria-like; flame test, green.

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196. *Heavy Magnesia* (*MgO*).—Alone in glycerin mount observe small rounded masses frequently grouped together; if dissolve, a few milligrammes on a slide or watch crystal in citric acid, then add a few drops (excess) of ammonium hydrate and Na_2HPO_4 and stir vigorously with a glass rod, triangular or tetragonal crystals are formed in glycerin mount.

197. *Light Magnesia* (*MgO*).—In glycerin mount looks like heavy magnesia, but masses are larger and more transparent. On treatment with citric acid, NH_4OH and Na_2HPO_4, the crystals of $MgNH_4PO_4$ in glycerin mount are large star-shaped, and look like snow crystals.

*** *Unaffected by acetic acid.*

† *Soluble in Nitric Acid.*—If necessary, in deciding on any of the next four, they are to be fused with K_2CO_3 or Na_2CO_3, and a regular qualitative chemical separation effected.

198. *Calcii Phosphas Præcipitatus* [$Ca_3(PO_4)_2$].—In glycerin mount alone get small tetragonal and cubical crystals. If to a few milligrammes of the powder on a slide we add a few drops of HNO_3

shaped crystals or long crystals in masses (looks like group of sklerenchyma fibres); flame test on platinum wire = bright reddish-yellow.

200. *Barium Sulphate.*—In glycerin mount alone observe irregular-shaped crystals varying from small to large; flame test = green.

201. *Terra alba.*—This is aluminum silicate (3:5) and magnesia.

†† *Insoluble in nitric acid.*

202. *Antimony Oxide.*—In glycerin mount alone get irregular, transparent, small to large fragments; add drop of HCl to powder on the slide, then pass H_2S over the solution, get orange-red precipitate.

203. *Antimonial Powder.*—Small tetragonal and cubical as well as irregular transparent crystals. Add HCl, then H_2S = orange-red precipitate.

(*To be continued.*)

GLEANINGS FROM THE MEDICAL JOURNALS.

BY CLEMENT B. LOWE, M.D.

GLASS MILK JARS.

The employment of individual glass jars for the retention of milk delivered by peddlers has been prohibited by milk inspectors in several cities, on the ground that they are dangerous to public health. The objection is advanced that their sterilization is impossible, as water of the requisite temperature to destroy germs would break the jars. Safety is only insured by the use of receptacles that can be subjected to steam heat. The glass jar has been tabooed at the West Point Military Academy, and should be generally abolished, and especially its pasteboard coverlid.—*Phila. Med. Jour.*, August 13.

REPEATING PRESCRIPTIONS.

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H. CONTAINING TANNIN MASSES.

166. *Chimaphila.*—See No. 12, crystals.
167. *Galla.*—See No. 4, crystals and starch.
168. *Gaultheria.*—See No. 17, crystals.
169. *Hamamelis.*—See No. 33, crystals and hairs.
170. *Uva Ursi.*—See No. 37, crystals.

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shaped crystals or long crystals in masses (looks like group of sklerenchyma fibres); flame test on platinum wire = bright reddish-yellow.

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TO REMOVE A FOREIGN BODY FROM UNDER THE NAIL.

Alternately soften the nail with the end of a match dipped in caustic potash, and scrape with a piece of glass until the object is reached.—*Journal de Med. de Paris*, July 3.

SALT AS AN ANTISEPTIC.

According to the *Cronica de Ciencias Medicas de Filipinas*, the insurgents dress wounds with dry salt or strong brine, from lack of usual antiseptics, and wounds from fire-arms heal under it in four or five days.—*Jour. Amer. Med. Assoc.*, August 20.

MODERN BULLET WOUNDS.

"The destructive character of the bullets when they strike a hard surface, was shown in the wounds treated during the recent riots in Milan, states the *Klin. Therap. Wochenschrift*, of June 26th. Every arm or limb wounded had to be amputated; every person shot in the trunk died, and whenever the skull was struck, the top was lifted up like the cover of a box, and the brain matter scattered around." —*Jour. Amer. Med. Assoc.*, August 20.

THE PARIS SEWAGE PARK.

The luxuriance of the vegetation on these fields is remarkable; all kinds of vegetables and medicinal plants thrive to perfection, irrigated with water from the Paris sewers, which is so purified in its course that it emerges from the "park" limpid and pure, as visitors taste and exclaim. There is no perceptible odor except in the midst of a network of irrigating canals, and a few steps beyond it is impossible to distinguish it. All fear of contaminating the atmosphere of the vicinity has proved groundless. The number of bacteria is reduced to approximate spring water, and the authorities claim that the infection of the Seine will diminish with increased areas appropriated for sewage parks, until it will cease altogether, when all the sewer water from the city is spread out thus on the fields. The amount thus ultilized is 20,653 cubic metres to the hectare; there are 795 hectares (1,964 acres) devoted to the purpose.—*Jour. Amer. Med. Assoc.*, August 27.

SPEECH DEFECTS.

Scheppegrell (*New Orleans Med. and Surg. Jour.* for August) writes on the etiology and treatment of stuttering, stammering, etc., and groups the forms of speech defects in two classes: paralalia and dyslalia, the former referring to defective speech, lisping, etc., and the latter to difficult or spasmodic speech, as stammering and stuttering. He considers prophylaxis of the utmost importance,

and believes the inclination of mothers to teach their children baby-talk cannot be too severely condemned, as they become so accustomed to this method of speech as to make it difficult to change it. He points out that girls suffer less from the more severe forms of speech defects than boys, and some authors have even doubted the existence of female stutterers, while Coen of Vienna, places the number at only 1·5 per cent. of the whole number affected. He says that children should not be allowed to associate with stammerers, as the children may not only be influenced, but there is also a tendency to aggravate the defect in the case of the stammerer.

THE CONGENITALLY BLIND AS OUTLOOK MEN AT SEA.

The *Dublin Journal of Medical Science* for August quotes the *Lyon Medical* for July 17th as stating that the frightful catastrophe of the sinking of the steamship "Bourgogne" recalls a lecture delivered some years ago by Dr. Dufour, of Lausanne. This celebrated oculist, interested in the means of securing a livelihood for the unfortunate blind, passed in review all the callings which might make use of the extraordinary power of hearing with which these persons are endowed. Among others, he declares that all swift vessels should have on board two men born blind to serve as outlook men in foggy weather. Dr. Dufour asserts, as a result of experiments made on the Lake of Geneva, that the acuteness of hearing in these persons is such that they can easily recognize at a great distance the noise of a moving vessel, and, *a fortiori*, the acoustic signals which it may make with the object of furnishing exact information as to its position and course.

The suggestion is a valuable and a practical one.—*N. Y. Med. Jour.*, August 20.

RECENT LITERATURE RELATING TO PHARMACY.

DETERMINATION OF MANGANESE IN PLANTS.

P. Richard gives a colorimetric method (*Compt. rend.*, 1898, p. 550) for the rapid determination of manganese in plants and humous soils. The plant or soil is incinerated, fused with sodium or potassium carbonate, a little nitric acid is added, and then placed in a test-tube with a little minium or lead bioxide, water containing some nitric acid added and the solution boiled. The rose color of the solution indicates manganese.

SWEET GUM OIL.

The leaves of *Liquidambar styraciflua L.*, have, when bruised, a peculiar turpentine-like odor. When distilled they yielded only 0·085 per cent. of oil, having a greenish-yellow color, a specific gravity of 0·872, the optical rotation 38° 35′, the saponification number 0·9, and the acetylization number 25·2. The oil contains terpene, borneol and bornyl acetate, and the odor recalls that of the oil of *Abies pectinata*, D. C —*Schimmel's Report*, 1898, p. 53.

CHINESE INSECT WHITE WAX.

According to G. F. Smithers (U. S. Consular Reports, 1897, p. 484) the best of the insects (*Coccus pe-la*) that produce white wax are found in the Chien-Chang Valley. Those from elsewhere bring a lower price, where they are found on the evergreen, *Ligustrum lucidum*, which has various local names, as ch'ung shu, or insect tree; tung ching shu, or evergreen tree; and pao-kê-ts'ao shu, or crackling flea tree. The insects from Chien-Chang Valley, found for the most part near the town of Tê Chang on the Au-ning River (latitude 27° 24′), are transported to the plain north of the Ta-tu River north of Chien Chang, where they are placed on the wax tree, *Fraxinus chinensis*, known to the Chinese as the pai la shu. One pound of the scales produces 4 to 5 pounds of wax. The process of obtaining the wax is described.

ASSAY OF SYR. IODIDE OF IRON.

Ralph S. Swinton (*Chem. and Drug.*, 1898, p. 837) proposes the following: Dilute 10 c.c. of the syrup with 90 c.c. water; slowly mix 10 c.c. of this solution with 5 c.c. of strong sulphuric acid, keeping the vessel cool by allowing a stream of cold water to flow over it. When nearly cold, thoroughly agitate the mixture with 5 c.c. of phenol (90 per cent.), then with 25 c.c. of a completely saturated bromine water; remove the separated iodine by washing out with chloroform (two washings usually suffice), treat the mixture again with phenol-bromine, separate the iodine as before and mix with the first portion. The whole chloroformic-iodine solution is now covered with a layer of water and titrated with decinormal sodium thiosulphate, with starch paste as an indicator. 1 c.c. decinormal sodium thiosulphate = 0·0155 gm. FeI_2. The whole process occupies only a few minutes and is accurate.

INFLUENCE OF THE ORGANISM ON TOXINS.

E. Metchnikoff concludes (in *Ann. Inst. Pasteur*, xi, p. 801) that plants such as bacteria and fungi can destroy toxins and transform them into vaccines without producing an antitoxin; that the invertebrates are capable of producing a tetanic antitoxin in appreciable quantities; that the production of antitoxins begins in the animal series with the crocodiles, where the power is more highly developed than in the higher animals; that the antitoxic power is not to be considered as bound to any febril reaction whatever; that the antitoxic property of the fowl is in the blood; that it is not possible to accept the idea that natural immunity depends on the antitoxic power, and that the antitoxic property in the animal kingdom has an evolution less ancient than the phagocytic reaction.

THE CARBONYL FIGURE IN ESTIMATION OF RESINS.

M. Kitt (*Chem. Zeit.*, 1898, p. 358) proposes to apply the method of Strache (*Ibid.*, 1891, p. 1207), used by him in the determination of the carbonyl oxygen of aldehydes and ketones, to the analysis of the resins. The resin to be examined is treated with acetate of soda and 20 c.c. of a 5 per cent. alcoholic solution of phenyl hydrazin-chlorhydrate, whereby there is formed with the hydrazin salt a hydrazone compound. The excess of hydrazin salt that is taken is obtained by oxidizing the excess with a hot Fehling's solution and measuring the nitrogen given off. A check test with the hydrazin solution alone is made, and the difference between the two gives the amount of nitrogen given off in the reaction. The carbonyl figure, *i. e.*, the per cent. of carbonyl oxygen of the substance is obtained from the formula:

$$\text{Per cent. O} = (V - V_o)\frac{0.07178}{S}\,9.$$

The $V - V_o$ is the difference in volume of the nitrogen calculated to 0° and 760 millimetres pressure, and S is the amount of substance taken in grammes.

CONSTITUENTS OF LICORICE.

A. Tschirch has carried out some investigations on glycyrrhiza root (*Schweiz. Woch. f. Chem. u. Pharm.*, 1898, 189), and he finds three substances, viz.: glycyrrhizin, mannit and a sugar, which he did not succeed in crystallizing. He obtained 2·5 per cent. of pure

glycyrrhizin from air-dried Russian licorice root. The researches are to be continued.

TEST FOR COTTON-SEED OIL.

G. Marpurgo (*Schweiz. Woch. f. Chem. u. Pharm.*, 1898, p. 184) has experimented with the new method for detecting cotton-seed oil in oil mixtures, as given by Fortelli Ruggeri (*Selmi*, 1898, p. 1). The method (*Schweiz. Woch. f. Chem. u. Pharm.*, 1898, 194) is as follows: 5 grammes of the oil is mixed with 30 c.c. of a 6 per cent. alcoholic KOH solution and saponified at a comparatively low temperature. It is neutralized with acetic acid, using two drops of a phenolphthalein solution as an indicator. After this, it is saponified with a 10 per cent. neutral lead acetate solution. The soap is washed with lukewarm water, dried on filter paper and treated with 100 c.c. ether in a flask connected with a reflux condenser. It is heated for a few minutes and then allowed to stand for a half hour. The lead salts of the stable fatty acids separate and are removed from the ethereal solution. The latter is treated with HCl in a separating vessel and freed from lead. The ethereal solution is washed with water until all traces of acid are removed and then filtered and distilled. The residue from the distillation is taken up with 10 c.c. of 90 per cent. alcohol and treated in a test-tube with 1 c.c. of a 5 per cent. aqueous silver nitrate solution and heated to 60°–80° C. on a water-bath. If there was no cotton-seed oil present, the solution is clear from one-quarter hour to one hour. If cotton-seed oil is present, the solution becomes dark and blackens and deposits a black precipitate. This reaction is characteristic for admixtures of 1–5 per cent. of cotton-seed oil, and is characteristic for this oil alone.

The author also experimented satisfactorily with the method of Cavalli, using resorcin, given in *Selmi*, 1897, p. 113.

SPIRITUS SAPONATUS.

For the preparation of spirit of soap in the cold, L. Meissen (*Pharm. Zeit.*, 1898, p. 254) proceeds as follows: 10·5 parts of melted KOH are dissolved in 50 parts of alcohol; to this is added 60 parts of olive oil. The saponification occurs in a few hours, with occasional shaking of the mixture. After this, 250 parts of alcohol, and then 230 parts of water are added, and the spirit filtered.—*Chem. Zeit.*, 1898, p. 119.

EDITORIAL.

DEFINITION OF POISONS.

It is more and more evident as the time draws near for the publishing of the next Pharmacopœia, that the Committee on Revision has to consider the introduction of new features which may or may not be desirable. Some say: "Incorporate the National Formulary with the Pharmacopœia!" Others say: "Put in maximum and minimum doses!" And still others now say: "The Pharmacopœia is the authority to define what shall constitute a poison!" Regarding these advocates and their desires, we repeat what was said in the June number of this JOURNAL, that some will object to the coming Pharmacopœia, doubtless, because it is not permeated with sufficient material that is required in everyday practice, and may say that it does not represent the professions of to-day. It must be borne in mind that the research and practice of to-day is always a step in advance of the knowledge that is accepted. There always must be the experimental or "scouting" party in search for new truths, and these are the results that are apt to be upon every tongue, and in every office and shop, and ofttimes uppermost in the minds of those who are engaged in daily practice of the professions. But these things with their reports neither represent truth nor definite knowledge, nor anything that is certain and ought to be made pharmacopœial. This distinction can only be given these reports when this knowledge has been shaped into something definite and certain, and has been repeatedly confirmed by others.

It is not our purpose to say anything with regard to the desirability or undesirability of introducing the National Formulary or doses into the Pharmacopœia, but to consider some of the difficulties involved in a definition for the word "poison," and ask, "Suppose the U.S.P. did give us a perfect definition, of what use would it be?" Unquestionably, those who ought to be consulted in the framing of a definition of poisons are the medical writers and experts on toxicology, medical jurisprudence, and the makers of dictionaries. If we consult these we find, for instance, that:

Beck says: "The ancients considered everything as poisonous that produced malignant symptoms and attacked directly what we style the vital principle. Dr. Mead's definition includes every substance which in small doses can produce great changes in the living body. Foderé considers poisons to be those substances which are known by physicians as capable of altering or destroying, in a majority of cases, some or all of the functions necessary to life." He, however, adopts the definition given by Guy, that "a poison is any substance which, when applied to the body externally, or in any way introduced into the system without acting mechanically, but by its own inherent qualities is capable of destroying life."

Reese defines a poison as "a substance which, when introduced into the body by any method, occasions disease or death; and this as an ordinary result in a state of health, and not by a mechanical action."

Wharton and Stillé say: "Physicians generally understand by the word poison a substance having an inherent deleterious property, which renders it, when taken into the system, capable of destroying life. It is difficult, however, to give a definition to the term which will meet the significance attached to it by different classes of persons, for while in common language, poisons are understood to be those articles only which are deadly—in small doses—as strychnine, prussic acid, arsenic, etc.—the lawyer and the physician will unite in affixing to it a general meaning, similar to which we have given above."

Taylor defines a poison to be (as commonly defined) "a substance which, when administered or taken in small quantity, is capable of acting deleteriously on the body. In proper language, this term is applied only to those substances which destroy life in small doses. This

popular view of the nature of a poison is too restricted for the purposes of medical jurisprudence." * * * * If then a medical witness is asked "What is a poison?" he must beware of adopting this popular view, or of confining the term "poison" to a substance which is capable of operating as such in one small dose. In legal medicine it is difficult to give such a definition of a poison as shall be entirely free from this objection. Perhaps the most comprehensive which can be suggested is this: "A poison is a substance which, when absorbed into the blood, is (by a direct action.—ED.) capable of seriously affecting health or destroying life." [The definition given by *Dr. Alexander W. Blyth* in his work on poisons is perhaps the best: "A substance of definite chemical composition, whether mineral or organic, may be called a poison, if it is capable of being taken into any living organism, and causes, by its own inherent chemical nature, impairment of function."]

Kobert says: "Der Begriff *Gift* bedeutet im gewöhnlichen bürgerlichen Leben etwas anderes als in den Wissenchaften, ja selbst in diesen nicht immer dasselbe.

"Der LAIE kennt nur unbedingte Gifte: Arsenik, Phosphor, Blausäure etc. sind für ihn *Gifte schlechthin*, d. h. er nennt diese Stoffe selbst dann noch Gifte, wenn sie zu Arzneilichen Zwecken gebraucht werden und handgreiflichen Nutzen schaffen.

"DIE MEDICINISCHE WISSENSCHAFT kennt solche *unbedingte* Gifte (venena absoluta) überhaupt nicht, sondern nur *relative;* d. h. jedes absobute Gifte des gemeinen Mannes kann im Sinne der Wissenschaft auch als Arznei wirken; umgekehrt können Zahlreiche Stoffe, welche der Laie nicht als Gifte bezeichnet, im Sinne unserer Wissenschaft gelegentlich als Gifte wirken, z. B. selbst das so indifferente Kocksalz. Endlich brauchen nach der Lehren der modernen Medicin die Gifte gar nicht von aussen eingeführt werden, sondern können im Körper entstehen.

"DIE JURISTISCHE WISSENSCHAFT steht noch anders: bei ihr kann von Vergiftung nur geredet werden, wenn wirklich eine Substanz *gegeben* oder *genommen* worden ist; im organismus des Menschen entstandene Gifte, mögen sie auch noch so fruchtbar wirken, ja mögen sie selbst mit bekannten anderen Gitten identisch sein (Muscarin), sind also nach den Anschauungen unserer Juristen keine Gifte. Weiter muss die betreffende Giftsubstanz juristischer Definition gemäss gegeben oder genommen sein, *um die Gesundheit zu schädigen*; d. h. eine nach medicinischer Anschauung selbst noch so giftige Substanz wird erst dann für den Juristen zum Gift, wenn dem Verbrecher *bekannt ist, dass sie die menschliche Gesundheit zur zerstören geeignet ist.* Es kommot also der Jurisprudenz auf den *Dolus* an. Wer daher z: B. Jemanden Arsenik giebt, um ihn blühend aussehen zu machen, ihn aber dadurch tödtet, hat im Sinne des Gesetzes keinen Giftword, sondern eine *fahrlässige Tödtung* begangen."

Kobert then adopts with some reserve this definition for poisons in his medical Toxicology. "Gifte sind solche, theils unorganische, theils organische, im organismus entstehende oder von aussen eingeführte, theils künstlich dargestellte, theils der Natur vorgebildete, nicht organisirte Stoffe, welche durch ihre chemische Natur unter gewissen Bedingungen irgend welches Organ lebender Wesen so beeinträchtigen, dass die Gesundheit oder das relative Wohlbefinden dieser Wesen dadurch vorübergehend oder dauernd schwer beeinträchigt wird."

From a *pharmacological standpoint* Kobert brings his definition into the following kernel: "Gifte sind alle pharmacologischen Agentien, wenn sie in einen gegebenen Falle nicht nützlich sondern schädlich wirken."

He then sums up the matter and says: "Aus dieser Zusammenstellung geht hervor, dass in *keine Lande das Gesetz im Stande ist den Begriff Gift scharf zu definiren.* Nichts destoweniger lässt sich fast in allen Fällen medicinisch vor Gericht genau angeben, ob in einem bestimmten Falle eine Vergiftung vorliegt oder nicht. Der im Staatsdienst stehende Mediciner muss sich eben gewöhnen, vor *Gericht juristisch zu denken.* Wenn er den Fall dann später für ein medicinisches Blatt zur Publikation Zurecht macht, so kann er auch der wissenschaftlichen Medicin volle Gerechtigkeit wiederfahren lassen, ohne dass er fürchten muss, mit sich selbst in Widerspruch zu kommen."

Ed. R. von Hofmann says: "Unter Giften versteht man Substanzen, welche schon in verhältnissmässig kleiner Menge in den Organismus gebracht, auf andere als mechanische oder thermische Weise die Gesundheit zu schädigen oder den Tod herbeizuführen vermögen. Diese Begriffsbestimmung lässt zwar von streng toxicologischen Standpunkte manchen Einwand zu, entspricht jedoch dem allgemeinen sprach gebrauche und dürfte umsomehr genügen, als es bis jetzt nicht gelungen ist, den Begriff 'Gift' vollkommen genau zu definiren."

Herman says: "Gift nennt man diejenigen Substanzen, welche in thierische Organismen eingeführt in denselben functionelle Veränderungen herbeiführen. Zuweilen fasst man die

Definition enger, in dem man nur dann eine Substanz Gift nennt, wenn sie schon in kleiner Menge wirksam ist und wenn die von ihr hervorgebrachte Veränderung den Bestand des Organismus gefährdet. Da jedoch diese Einschrankungen nicht streng begrenzt sind, so sind sie entbehrlich, zumal da, wie sogleich gezeicht werden wird, der Umfang des toxicologischen Materials sich durch andere Rücksichten bestimmt, als durch die Definition des Wortes 'Gift,' welche nur in juristicher Hinsicht bedeutsam ist."

Dunglison says the term poison is a "generic name for all substances which, when introduced into the animal economy, either by cutaneous absorption, respiration, or the digestive canal, acts in a noxious manner on the vital properties or texture of an organ. Hence we speak of *fever poison*, *cholera poison*, etc. Poisons exist in the three kingdoms of nature; poisons from animals are called *venoms*, as the venom of the viper, etc., whilst those that are the product of disease have the name *virus*. In common parlance, therefore, the word poison is restricted to deleterious articles furnished by the mineral and vegetable kingdoms."

Thomas uses the term poison to include "an animal, vegetable or mineral substance, which, when applied externally, or taken into the stomach, or the circulatory system operates such a change in the animal economy as to produce disease or death." A similar definition is given in Lippincott's Medical Dictionary.

Gould defines a poison as "a substance that destroys the life of an organism or impairs the functions of one or more organs."

It is apparent from these numerous citations of medical authorities that we have in the term poison an indefinite something. Wharton and Stillé, Herman and Kobert give us the basis for an ideal definition. We find that the term poison may be applied to those substances which, when introduced into the animal organism, cause functional disturbances. It matters not how introduced, or what the action, or what the origin, dose or even the motive may be. Von Hofmann and Kobert, however, warn us further that it has not been possible as yet to exactly or successfully define the word poison in any land.

We admit the desirability of having a definition for poisons which shall protect all mankind to the fullest extent, but there are so many factors which influence this subject, and not the least those of disease and the peculiarities of the individual, that it must be apparent that it is by no means a promising task for the Committee on the Revision of the Pharmacopœia to undertake at present. A book of the size of the Pharmacopœia itself might be written and the task not completed.

This subject ought to be carefully considered as it really is the point of departure in considering the question of the introduction of dosage in the U.S.P. To sum up we would say that an ideal definition for the word poison would leave the subject just as we understand it to-day, subject to numerous conditions and circumstances, depending upon the intelligence and competency of those having the sale thereof; and any other definition would be impracticable. Therefore, we believe that, for the present, the Pharmacopœia cannot undertake to define what is a poison.

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REVIEWS AND BIBLIOGRAPHICAL NOTICES.

BULLETIN OF THE BOTANICAL DEPARTMENT, JAMAICA. Edited by William Fawcett, Director of the Public Gardens and Plantations. Kingston, Jamaica: Government Printing Office, 79 Duke Street. 1898.

This Bulletin contains information concerning the following subjects: Report on Sugar Cane, Anti-Malarial Tree, Wild Olives of Jamaica, Methods of Propagating Oranges and other Citrus Fruits, Analysis of Cuba Tobacco Soil, Synoptical List of Ferns, Contributions and Additions to the Library, etc.

It has been stated frequently in the Bulletin that the olive (*Olea Europæa*) has not been known to flower or fruit in Jamaica. Nevertheless, numerous communications are received to the effect that the writers have seen the olive tree bearing fruit. In all these cases the examination showed that there are several wild olives, but none of them are the true olive of commerce. Information given to inquiries on this point have more than once saved the investment of capital in an attempt to introduce and grow the olive on a commercial scale in places where a "*Wild Olive*" is known to bear abundant fruit. Some of these "Wild Olives" are *Ximenia Americana*, L. (N. O. Oleaceæ), called Mountain Plum or Seaside Plum. The tree is usually armed with spines, and the leaves are not opposite, as in the olive. The fruit is about the size of an olive, of a yellow color, with a peculiar aromatic flavor and delicious perfume; there is one stone, the kernel of which tastes like a filbert. The fruit is useful in cases of habitual constipation and gastric troubles when the irritating action of drastic purgatives is to be avoided; the kernel being more strongly purgative. *Ximenia* is a native of the tropics, and in India the Brahmins use the yellow wood as a substitute for sandal wood in their religious ceremonies.

Another "Wild Olive" is the product of *Terminalia Buceras*, Wright (N. O. Combretaceæ), called the "Black Olive" or "Olive Bark Tree." The leaves of the tree differ from those of the true olive not only in the way they grow, but also in being broader at the top than below. The berry is only a quarter of an inch long, with the remains of the calyx at the top. Related to this is *T. Hilariana*, Stend, a tree much resembling *T. Buceras*, and the berry is twice as large. Both are natives of the West Indies and the northern part of South America.

Bontia daphnoides, L. (N. O. Myoporineæ), is a shrub in the French West Indies, and known as "Olivier bâtard." The leaves are in shape like an olive, but they are not opposite. A decoction of the flowers is recommended for ophthalmia. The fruit is yellowish, nearly one-half an inch long, and when ripe contains an oil of a yellowish color, which is employed in colic and other irritations of the intestines. It may be that it is on this fruit the famous Ring Tail Pigeons get so fat and acquire their bitterish flavor.

The Director announces that they are ready to distribute young seedlings of an "*anti-malarial tree*," *Melaleuca leucadendron*, L. Regarding this tree,

Baron Sir F. von Mueller said in a letter: "This tree should become of the utmost importance also to the Western Hemisphere. As a tropical tree, fit to grow in malarian swamps and containing in its foliage much antiseptic and anti-miasmatic oil, it deserves your especial attention. It will grow where no eucalyptus could be reared." He further states in his "Select Extra Tropical Plants:" The Cajaput tree of India, North and East Australia, is found as far extra-tropical as 34° south latitude. This tree attains a height of about 80 feet, with a stem reaching 4 feet in diameter, on tidal ground; it can, with great advantage, be utilized on such intra-tropic areas and in salt swamps for subduing malarian vapors, where no eucalyptus will live. The lamellar bark protects it against conflagrations. It is splendid for fruit packing; oranges kept four months in it; lemons, five months; apples, 3 months. The wood is fissile, hard and close grained, regarded as almost imperishable underground, and resists the attacks of termites (white ants). It is well adapted for posts, wharf piles, shipbuilding and various artisans' work. The foliage yields the well-known Cajaput oil, so closely akin to eucalyptus oil. Mr. K. Staiger obtained on distilling the leaves as much as 2 per cent. of oil, which might be manufactured on a large scale from ample material in many parts of Australia. It is rich in Cineol. The tree should be extensively planted where yellow fever occurs."

BOTANIC GARDENS AND DOMAINS. Report for year 1897 from J. H. Maiden, Director Botanic Gardens, Sydney. This report deals particularly with the changes and additions made in the Botanic Gardens of Sydney. Among the items we note with regret that the large indigenous trees, those which were probably in their present position before Captain Cook visited these shores, are dying out. During the gale in August, 1897, a fine tree of white or cabbage gum (*Eucalyptus hæmastoma, var. micrantha*) fell down and smashed a seat made of 2-inch hardwood to splinters. Fortunately no one was injured.

MEMOIRS OF THE AMERICAN ACADEMY OF ARTS AND SCIENCES. Cambridge: John Wilson & Son, University Press, June, 189-.

In these memoirs is contained some new observations on the Planet Mercury (with 8 plates) by Percival Lowell. These observations tend to show that the Planet Mercury is an ellipsoid and a body somewhat larger than has been supposed, its polar diameter subtending a distance of about 33,000 miles. Rotating in 87.969 days its orbital period.

Its density is much less than the earth's. Its mass being probably about $\frac{1}{20}$ that of the earth's. It possesses no certain signs of atmosphere, water, vegetation or organic life. It is a world as dead as the moon, but differently brought to such condition.

COMPOSITION OF MAIZE (INDIAN CORN), INCLUDING THE GRAIN, MEAL, STALKS, PITH, FODDER AND COBS. Compiled chiefly from the Records of the Division of Chemistry, by W. H. Wiley, chemist of the Department of Agriculture, Washington, D. C.

An attempt has been made to briefly review the chief points connected with the constitution and economic value of the Indian-corn plant. It is predominantly the characteristic cereal crop of the United States, and its money value is, perhaps, greater than that of any one crop, with the exception of cotton. It has been shown that it is a valuable food for man and that it is the

chief food of the domestic animals of our great country. In addition to this, large quantities of starch are made from it, and also glucose and grape sugar. It not only serves as our food, but also furnishes a part of our drink, in the form of the various grades of Indian-corn whiskey. In addition to this, it is the source of an immense industry in the manufacture of alcohols, high wines and Cologne spirits. The stalks, which a few years ago were considered an injurious residue, have been found to possess most valuable properties as cattle food. Especially is this true of the outer shells. The inner portion of the stalk—the pith—possesses remarkable properties as an obturator in the manufacture of battle ships. It possesses a high degree of resilience and porosity, and when perforated by a shot or shell it instantly closes the aperture made by the projectile, and thus prevents the entrance of water into the vessel. It also has peculiar properties rendering it suitable for the manufacture of pyroxylin varnishes, gun cotton and high explosives. By reason of the nature of its construction it is easily nitrated. The acids are completely removed by washing, and the resulting compound is more stable, and, therefore, more valuable, than that which is derived from cotton under similar treatment.

It has been deemed wise to collect the above results of recent work which has been done in the Chemical Division of the Department of Agriculture on the subject of Indian-corn, especially because the merits of this plant are not well appreciated in Europe, where Indian-corn is not regarded as a fit source of human food, and where its genuine nutritive properties and the properties of the stalks are not known. It is believed that by calling the attention of the scientific men of Europe to Indian-corn, good will result, not only to the country which is interested in the growth of this great cereal, but to Europe, where cheap and nutritious food products are desired.

PROCEEDINGS OF THE AMERICAN ACADEMY OF ARTS AND SCIENCES. Vol. XXXIII. Reprints on the following topics have been received:

ON THE CAUSE OF THE RETENTION AND RELEASE OF GASES OCCLUDED BY THE OXIDES OF METALS. By Theodore W. Richards.

The evidence of this paper proves that in reality no discrepancy exists between the results of Scott (*Jour. Chem. Soc. Trans.*, LXXI, 559) and Morse and Arbuckle (*Amer. Chem. Jour.*, XX, 195) and those obtained at Harvard. The apparent disagreements were caused by the fact that the later experimenters investigated parts only of the whole field outlined in 1892 (*Proc. Amer. Acad. Arts and Sci.*, XXVI, 281). The paper also shows that the unequal escape of oxygen and nitrogen imprisoned in the oxides of metals is a phenomenon of great interest, capable of shedding light on the internal kinetics of solids.

A CONTRIBUTION TO THE STUDY OF INDIVIDUAL VARIATION IN THE WINGS OF LEPIDOPTERA. By William L. W. Field.

The author has worked upon the moth, *Thyreus abbotii*, Swamsin, one of the common Sphingindæ of Eastern North America. He offers the following hypothesis to explain the smaller variability of the sinuous margin in the females. The fact that the wing broadens so greatly toward the tip, and is provided with an irregular edge, suggests that this form of margin may be of advantage in rendering the insect less distinctly visible when its

wings are in rapid motion. The sinuous margin being of less importance, comparatively, for the male, we can understand its greater variability in the sex where it is less rigidly selected.

OCCURRENCE OF NATIVE COPPER AT FRANKLIN FURNACE, NEW JERSEY. By J. E. Wolff.

The occurrence of native copper here increases the long list of minerals found at Franklin furnace and vicinity (now nearly seventy) and is an interesting addition to the occurrence of native copper below the zone of surface oxidation.

EXHIBITION AND PRELIMINARY ACCOUNT OF A COLLECTION OF MICROPHOTOGRAPHS OF SNOW CRYSTALS, MADE BY W. A. BENTLEY. By J. E. Wolff.

The same general types of crystals noticed by previous observers recur here, such as the star form, star form with solid nucleus and tabular form, while the columnar form (hexagonal prism and base) is rare and the hexagonal pyramid is not seen. Mr. Bentley confirms the previous observations, that the large stellate crystals are more common at the higher temperatures and the tabular ones at the lower.

AN INQUIRY INTO THE NATURE OF ELECTRICAL DISCHARGES IN AIR AND GASES. By John Trowbridge.

According to the author, beyond 1,000,000 volts the initial resistance of atmospheric air to electrical discharges becomes less and less, and, in certain conditions, can be as low as 1,000 ohms between terminals two or three metres apart.

REVISION OF THE MEXICAN AND CENTRAL AMERICAN SPECIES OF GALIUM AND RELBANIUM. By J. M. Greenman.

DIAGNOSES OF NEW AND CRITICAL MEXICAN PHANEROGAMS. By J. M. Greenman.

Both of these papers by Dr. Greenman are of a systematic nature, and are contributions from the Gray Herbarium of Harvard University.

NOTES ON THE PROJECTIVE GROUP. By E. W. Rettger.

The author finds that a number of the sub-groups of the projective group in two or three variables are not properly continuous except in the neighborhood of the identical transformation.

MEETINGS OF THE BOARD OF TRUSTEES.

A special meeting of the Board of Trustees was held on August 26, 1898, by the direction of the President of the College, to take action relative to the death of Professor Henry Trimble, who died at noon on the 24th day of August. W. J. Jenks was made the Chairman *pro tem.*, and announced in a few words the object of the meeting and loss the College had sustained. The various members present gave personal attestation of their appreciation of Professor Trimble, of his devotion to duty, his untiring industry, his steadfast friendship and loyalty to the interests of the College. A committee, consisting of Jos. P. Remington, Chas. Bullock and Jos. W. England, were appointed to draft resolutions expres-

sive of the sense of the Board at his loss. The Board resolved to attend his funeral in a body.

The stated meeting of the Board was held on September 6th. Among other reports, the special committee to draft suitable resolutions by reason of the death of Professor Trimble, reported as directed, and a memorial notice was also prepared by Mr. Bullock. It was ordered that the latter be entered on the minutes, and that a copy, suitably engrossed, be presented to Mrs. Trimble.

The following is the memorial notice presented by Mr. Bullock:

At a special meeting of the Board of Trustees of the Philadelphia College of Pharmacy, held on the 26th day of August, 1898, the chairman announced the death of Professor Henry Trimble, in the forty-sixth year of his age, at his home in St. Davids, Delaware County, Pa.

The impressive silence that followed this announcement evidenced the sorrow felt by all present at the loss of one who had given the best years of his life to the service of this College.

The remarks made by members who had long been associated with him in College work were a just tribute to his memory.

He was highly esteemed for his personal character. His practical knowledge and scientific ability in the department which he had chosen for the work of his life was admired and appreciated. He possessed the faculty of imparting to others an interest in practical chemistry, and attracted to the laboratory of the College private students whose work has been a credit to the institution.

The success which attended his conduct of the Chemical Laboratory of the College demonstrated his ability as an instructor, and was recognized with great satisfaction by the Board of Trustees.

His work was not limited to instruction; the number of original investigations made by him were valuable additions to science. His work on the "Tannins" is the most complete monograph on that subject which has been published, and gained for him great credit for his labor, ability and the completeness of the work.

He also accepted the position of Editor of the AMERICAN JOURNAL of PHARMACY, and for nearly five years conducted it with success, contributing many valuable articles to its pages.

The mental activity of Professor Trimble was greater than his physical strength. His friends had noticed with sorrow indications of declining health, and advised him to seek quiet and rest during the summer months. His reply was characteristic of the man: "I would rather wear out than rust out."

He continued to work on a new edition of his Chemistry, in conjunction with Professor Sadtler, but was obliged to relinquish his part after a complete mapping out of the plan for its completion.

The loss to this College through the decease of Professor Trimble cannot be expressed in words. Those only who knew the value of his service as a member of the Faculty and of this Board, can appreciate the loss we have met with. His name will ever be gratefully remembered, and enrolled among those whom this College delights to honor.

The Committee on Instruction reported on the subject of providing for the conduct of the Chemical Laboratory, necessitated by the death of Professor Trimble. This report was carefully considered, and, after a full discussion of the subject, it was unanimously decided that the interest of the College would

be best served by placing the Laboratory during the coming year under the supervision of Prof. Samuel P. Sadtler, with Josiah C. Peacock, as assistant in charge, he having served in that capacity for several years under Professor Trimble.

THOMAS S. WIEGAND,
Secretary.

OBITUARY.

Dr. John Elishee De Vrij, C.I.E., died suddenly and unexpectedly on Sunday, July 31st, at his home in The Hague. He was born on January 31, 1813, at Rotterdam, where his father was a pharmacist. He was brought up to the profession of his father, and devoted himself with considerable studiousness to making himself a competent pharmacist. When he was but nineteen years of age his father died. Young de Vrij was the youngest of ten children, and his mother was dependent upon the pharmacy for their support. "By special royal dispensation de Vrij was authorized to submit himself for the qualifying examination, though he had not yet attained the minimum legal age." His previous efforts enabled him to successfully pass the examination with honors, and he carried on the pharmacy for eighteen years. He subsequently studied at Leyden University, and took his doctor's (Ph.D.) degree there in 1838. When his tutor, Mulder, was called to Utrecht University he was appointed lecturer in his stead in chemistry and pharmacy at the Medical-Pharmaceutical School at Rotterdam.

He began now to devote himself most assiduously to scientific work, although still keeping his pharmacy. He carried out a series of successful experiments which may be said to have laid the foundation of modern bacteriology.

"In 1847 he improved the processes for the manufacture of explosives, ultimately preparing nitro-glycerin and determining certain of its medical properties." He was a constant visitor to England at the meetings of the British Association for 1847–1851. These and other oft-repeated journeys to that country gained him the name, given him by Professor Graham, of the "Flying Dutchman." He also devoted himself to literary work, and made a Dutch translation of the famous Heinrich Rose's "Handbook of Analytical Chemistry." The result of this task brought him into direct correspondence with the foremost chemists of the day, among whom may be mentioned Pelletier, for whom Dr. de Vrij always entertained the highest regard and esteem.

In 1850 Dr. de Vrij saw his way clear to sell his pharmacy, and devote himself undividedly to his literary and scientific work. He had already published numerous papers on pharmaceutical subjects, as morphine, cherry laurel water, red phosphorus, etc. It may be mentioned that it was through Pelletier's influence and advice that he undertook certain investigations on the cinchona alkaloids. His researches attracted considerable attention, and induced the Dutch Government, in 1857, to send him as a supervisor of the development of cinchona plantations in Java. He remained there six years, and accomplished an immense amount of good in successful development of the cinchona industry. He then visited India and assisted the Indian Government in the cultivation of the cinchona and the extraction of alkaloids. For his services in this direction he was awarded by the Queen of England with the C.I.E. in 1880.

He has been the recipient of many honors. In 1856 he was elected an honorary

member of the Pharmaceutical Society of Great Britain. In 1869 he became an honorary member of the Philadelphia College of Pharmacy. In 1871 he was elected a member of the American Pharmaceutical Association; as also an officier de l' Instruction, and, in 1873, a corresponding member of the Paris Académie Médicale. "In 1880 he was appointed a companion of the order of the Indian Empire and when he was celebrating his jubilee, ten years ago, he was made a Knight of the Netherlands Lion." A year ago Dr. DeVrij was the recipient of the Hanbury gold medal. Only so recently as June 25th, Dr. DeVrij celebrated his diamond jubilee as a scientific man. On the day of his diamond jubilee the University of Utrecht conferred on him the degree of M.D., *honoris causa*, in recognition of the great services his cinchona researches had been to mankind.

His body was shipped to Gotha for cremation, as there is no crematory existing in the Netherlands. Dr. DeVrij took an active part in all pharmaceutical matters up to the day of his death. He was an ideal investigator—scientific, and yet practical. His name will ever be associated with the successful development of the cinchona and its chemistry. He not only developed its successful planting and studied its chemistry, but also its successful administration In Dr. DeVrij's quinadrops (being, according to J. B. Nagelvoort, an acid aqueous fluid extract of cinchona, containing about 5 per cent. total alkaloids, and easily miscible with water in all proportions) we have one of the most successful and popular of pharmaceutical preparations. Professor Flückiger wrote a few years ago for *Reber's Gallerie*, an interesting biography of this most eminent quinologist.

Gonorol is the name given to the alcoholic constituents of East Indian sandalwood oil. It has been ascertained (*Chemist and Druggist*, 1898, p. 250) that these bodies are the active constituents of the oil and that the other substances present tend to cause irritation when the oil is administered for urethral troubles. The dose and methods of administration are the same as for sandalwood oil.

Peeling Cinnamon.—The work of peeling the bark from cinnamon shoots is performed entirely by members of the challa caste (*Ibid.*, p. 180), who are very expert at the business, and transmit it as a sacred heritage from father to son.

Local Application of Methyl Salicylate.—Linnoissier and Lannois (*Bull. de l'Acad. de Med.*, March 22, 1898) speak highly of the local application of methyl salicylate to the joints in rheumatic affections. They contend that it is converted in the blood into sodium salicylate, and that there is produced a local analgesic effect without any gastric irritation. The part is painted with the methyl salicylate and covered with several layers of india rubber. The usual dose is one, but sometimes two or three drachms, in acute cases are employed.—*Univ. Med. Mag.*, 1898, p. 744.

"*Waras,*" *the Indian Dye Stuff* has been investigated by A. G. Perkin (*Chem. News*, 1898, p. 20) who finds in it a number of principles, which are closely related to, though not identical with, those present in Kamala. Waras is a much stronger dye stuff than Kamala.

NOTES AND NEWS.

Corn Smut.—According to Dietrich (*Pharm. Zeit.*), the amount of alkaloids in Secale cornutum is somewhat higher than is given frequently in the text-books. Five samples yielded between 0·155 and 0·340 per cent. of alkaloids.

Balsam of Saô Thomé.—According to Moeller (*Ber. d. D. Pharm. Ges.*, 1898, p. 21) the tree which yields this balsam is one of the Burseraceæ, *Santiriopsis balsamifera*, Engl. It attains a height of 15 to 18 metres, and from it flows spontaneously a balsamic resin of reputed healing properties.

Poisoning by Copaiba.—A case is reported by W. H. Thompson (*Brit. Med. Jour.*), of a man aged twenty-seven, who had been taking the balsam for about three weeks. The face and whole body were covered with reddish patches. The temperature was increased, the pulse reduced. The urine did not show any indications of sugar or albumen. The medicine was discontinued and the patient recovered.

Microbes.—A scientist, looking for microbes, says there are absolutely none on the Swiss mountains at an altitude of 2,000 feet. Here is the place for the purity party; and scaremongers who are forever horrifying the public with the dismal fear of microbes; they would have to take their supply with them, most of which are useful to man. It is pleasing to observe that the microbe does not give himself lofty airs, but as a fellow-creature comes down to our level and dwells cheerily in our midst.—*Meehans' Monthly, from Revue Scientifique.*

Export of Arsenic.—The first quarter of the year 1898, presents some new features in exports from Liege, according to Consul Gilbert of that place. In 1895 arsenic was exported to the United States to the value of $19,998.77. In 1896 the aggregate of such exports was $18,051.77. In the first two quarters of the year 1897 no arsenic was invoiced at this Consulate, but during the last two quarters $29,225.14 worth of arsenic was forwarded to the United States. During the first quarter of 1898 the declared value of white arsenic at the Consulate was $15,961.23.—*Consular Reports*, June, 1898.

Chicago Retail Druggists' Association.—A special Committee on National Organization has issued a circular to retail druggists and their organizations in the United States, for the purpose of holding a delegate convention in St. Louis, October 17, 1898, out of which it is hoped a vigorous, centralized influence for the improvement and advancement of the commercial interests of the retail trade may be created. The Committee, of which William A. Dyche is Chairman, urges upon the druggists of the country an active and earnest participation in making this movement unqualifiedly successful.

Goat Milk Cure in France.—Consul-general Gowdy reports in Consular Reports (June, 1898): "I cannot discover that goat's milk is used for clinical purposes in France. It is, however, sometimes given to sickly children, when it is found that the milk of cows and the various prepared milks do not agree with them. Goat's milk is very rich in cream and nutritious substances and there is a popular belief that it is a useful article of diet in pulmonic and anemic complaints. It is served at the domiciles from troops of goats which are milked

on the spot, as it is believed that, to be efficacious, it must be drunk fresh from the animal.

Dr. William Osler.—A perfect deluge of deserved honors seems at present to have fallen to the lot of Dr. William Osler, of Baltimore, Md. No medical name is more frequently mentioned with favor at home or abroad than his, and no one has done, or is doing, more to merit such pleasant recognition. As a thinker, medical author, scientific observer and teacher, he has few peers and no superiors. It is only a few weeks since his name was mentioned in connection with membership in the Royal Society of Great Britain; then we learned that he had become Dean of the Medical Department of Johns Hopkins University; now we hear he is offered the chair in the University of Pennsylvania made vacant by the death of Dr. Pepper; and a despatch from Edinburgh, Scotland, lately related that the university of that city had conferred upon him the degree of Doctor of Laws. In his case, at least, we have evidence of the old saying that "it never rains but it pours."—*Am. Med.-Surg. Bulletin.*

Burdock as a Vegetable.—What is even regarded as a vile weed can, with a little stretch of imagination, be turned into an ornamental plant or delicious vegetable. This is especially the case with the common Burdock, *Lappa major.* Schoolboys all know it from gathering the burs and compressing them into a ball, they being held together by the curved points of the floral involucre. This is all they know about it. It is difficult to see anything more to be despised in the Burdock leaf than in the leaf of the rhubarb. It appears that it is largely used in China for food. But it is stated that, if the stalks be cut down before the flowers expand and then be boiled, the taste is relished equally with asparagus. The leaves, when young, are boiled and eaten as we eat spinach. In Japan, it is in universal use. Thousands of acres are devoted to its culture. But in this case, the root is the object. It requires deep soil to get the roots to the best advantage. The common name, in China, is Gobbo—a name, however, which need not replace our common one of Burdock.—*Meehans' Monthly.*

Rhodinol.—Bertram and Gildemeister state in the *Ber. d. D. Chem. Ges.*, 1898, that Poleck has for some time past reproached them for having fixed on the use of the name geraniol for the fluid alcoholic constituent of rose oil, which they termed rhodinol. The difference of the results of Eckart and other chemists (Markownikoff, Barbier and others) induced Bertram and Gildemeister to investigate the question, and they soon found that Eckart's "rhodinol" was a mixture. From this mixture they isolated a primary alcohol, and found it identical with that obtained from Turkish geranium oil by Jacobson, in 1870, and which possessed the formula $C_{10}H_{18}O$. This geraniol was described in the usual text-books, and Semmler's fine work on the constitution of these alcohols was already published, so that geraniol was necessarily the name applied to the pure isolated alcohol from rose oil. The more recent work of Tiemann and Schmidt, and of Barbier and Bonveault demonstrated the existence of a second alcohol in the alcoholic constituents of rose oil, which Tiemann and Schmidt showed was identical with Dodge's citronellol. Eckart's rhodinol is a mixture of about 70 per cent. of geraniol, 20 per cent. of citronellol, and 10 per cent. of non-alcoholic constituents, and there is no

question as to the real identity of the old "rhodinol" with pure geraniol.—*Brit. and Col. Drug.*, 1898, p. 561.

A Preparation of Koumys may be made, according to the *Dietetic and Hygienic Gazette* for August, as follows: Fill a quart champagne bottle to the neck with pure cow's milk; add two tablespoonfuls of white sugar, first dissolving it in a little water by the aid of heat; add also a quarter of a two-cent cake of yeast. Then securely fasten the cork in the bottle and shake the mixture well; place it in a room having a temperature of from 70° to 80° F. for six hours and finally in an ice-box for about twelve hours. It is then ready for use and may be taken in quantities varying with the requirements of the stomach and general condition of the patient. In preparing koumys it is well to make sure that the milk is pure, that the bottle is sound and the yeast is fresh. The bottle should be opened with great care on account of the effervescent properties of the mixture, and the latter should be discarded and not drunk at all if there is any curdle or thickened masses resembling cheese, as these indicate that the fermentation has been prolonged beyond the proper time. It should be prepared as required for use. The virtue of koumys resides in the fact that it nourishes, refreshes and stimulates, with no subsequent reaction from its effects. Koumys contains some alcohol, with fat, casein, lactic acid and carbonic acid gas. The cost is about fifteen cents per quart, including the bottle.—*The Medical Age*, 1898, p. 540.

Alcoholic Ferments in Nature.—In an investigation on the occurrence of alcoholic ferments in nature and their transportation, A. Berlese (Abs. in *Centralbl. Bakt. u. Par.*, 1897, p. 592) reports the results of investigations of soil from vineyards and from neighboring woods; bark from grapevines and from trees; leaves, flowers, fruit, etc., of the grape and other plants; insects, small animals and the air, for the presence of the ferments so necessary to wine making. The organisms of alcoholic fermentation were quite commonly found, although their occurrence was noticed at different times for different hosts. In April and June, *Saccharomyces apiculatus*, *S. ellipsoideus*, *S. pasteurianus*, forms of Torulopsis, *Mucor dematium*, etc., were found in the vineyard and wood soil, occurring at depths of 10 to 15 cm. in the vineyard and 4 to 36 cm. in the woods. Investigations showed their presence on the bark of oak and olive trees and elsewhere. None were found on the young grapes nor their peduncles in June, nor were any observed in the air during April or May, but in June and July *S. apiculatus* was found in the air.

Various insects were found to play a very important part in the distribution of the organisms. In general, it is claimed that the alcoholic ferments are carried to the grapes by ants, flies and gnats; they can pass uninjured through the digestive canal of the diptera. They are very active in the intestines of the diptera, the temperature being suited to their development.—*Expt. Sta. Rec.*, 1898, p. 1028.

Cicuta vagans, which grows in the low pasture lands of Oregon, has been found to poison cattle in late winter and early spring. According to U. P. Hedrick (*Oregon Sta. Bull.*, 46, p. 12, pls. 4) not less than 100 cattle in various parts of the State were poisoned last spring by this plant. In an experiment

in which the bulb was cut into small pieces and fed, along with carrots cut in the same way, to a two-year-old heifer at 8 o'clock A.M., death resulted one and a half hours later. Upon post-mortem examination, pieces of the root were found in the rumen and in the second stomach. The lungs were highly congested, but otherwise nothing abnormal was noted. On the following day an experiment with a calf was made at 9.15 A.M., and an attempt made to counteract the effects of the poison by giving an ounce of turpentine in a quart of milk. The calf recovered its feet and tried to walk. Soon there were indications of spasms, and the dose of turpentine and milk was repeated, when the calf stood up until 11.30 A.M., then it went down as before. Aconite and milk were then given, and also a hypodermic injection of nitroglycerine, but the animal died at 11.45 A.M. From the beginning of the experiment there was a decided rise in temperature, the highest being 106¼° F.

Similar experiments were made later in the season (May), and it was learned that much larger amounts of the bulbs could then be consumed without serious effects. Hence the author concludes that cattle are likely to be poisoned only from the first of January to the middle of May. The simple remedies, such as old bacon grease, flour and milk, recommended by stockmen in milder cases, the author thinks may be of some value, but that they will be unavailing with an animal that has swallowed even a very small quantity of the bulb when the poison is virulent. The best remedies are eradicating the plant from pastures or keeping cattle from lands where it grows.—*Expt. Sta. Rec.*, 1898, p. 892.

POISON IVY—RHUS TOXICODENDRON.—In the spring is the time for people to be poisoned by this plant; any one may handle it with impunity at any other time. Just when the new growth is beginning and the sap is running riot through its system, buds bursting, with free growth all along the line, it is at this time that the effluvia of the past year is pouring out into the atmosphere from its every pore through branch and leaf. One may see a silvery sheen on its leaves in the bright sunshine. Touch it not at this time. It does not poison all. I am not subject to it at any time. I would not dare to pull the leaves, bruise them and smear them on my face, in bravado as I have seen children do in years gone by, for I feel certain that it would poison me; but otherwise I handle it, work amongst it at all seasons of the year and receive no harm. There are immense quantities of the vine in this country. Nearly every tree in the woods has a plant or two clinging to it and the fences are loaded with it. I have met with men who have declared to me, that the Boston Ivy and Virginia Creeper, *Ampelopsis quinquefolia*, would poison them just as easily and as quickly as the *R. Toxicodendron* and that they dare not go near either of them in the spring. But I have always looked upon this last experience as a case of mistaken identity. The two vines generally grow together, are seen clinging to the same trees and the two plants are much alike when denuded of their foliage. As a cure for the poison, Nightshade—*Solanum nigrum*—is used; its leaves bruised, mixed with cream as an emollient; also Healall, *Brunella vulgaris*. Both are used in outward applications. These are the old-time remedies. Doctors must have better methods now. The Nightshade is poisonous (said to be) and used as a poison to correct another poison.

In this part of the world the chief complaint of rhus poisoning comes from colored leaf gathering in the fall.—F. K. STEELE, in *Meehans' Monthly.*

Henry Trimble